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ABSTRACT

These teacher's materials for a seven-unit course were developed to help students develop technological literacy, career exploration, and problem-solving skills relative to the communication industries. The seven units are on an introduction to communication, verbal communication, design and sketching, drafting, graphic reproduction, photography, and electronic communication. The first section is designed to teach teachers how to use the materials and includes an explanation of instructional elements, an instructional-task analysis for each unit, and a list of 28 references. The instructional elements for the units include objectives, suggested activities, information sheets, transparency masters, assignment sheets, job sheets, tests, and test answers. Some elements, such as the information sheets, include photographs, diagrams, and line drawings. (CML)

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Exploring Communication Technology

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EXPLORING COMMUNICATION TECHNOLOGY

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The Mid-America Vocational Curriculum Consortium, Inc.

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EXPLORING COMMUNICATION TECHNOLOGY

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FOREWORD

Technology education/industrial arts instructors are being asked to make radical changes in their programs to reflect the radical changes in our technological society. Rapid change and the current clamor for educational reform have made it evident that improvements must be made to meet the needs of students who will compete in a world quite different from the one they are experiencing in the classrooms and laboratories.

We are at the point where we need to overhaul traditional industrial arts programs and bring new and emerging technologies into the curriculum. However, the lack of instructional materials to support this new curriculum effort has made it extremely difficult. Hopefully, the new **MAVCC Technology Education Series** will aid teachers in updating and revitalizing their programs.

The series begins with *Exploring Technology Education*, Level I, which is followed by four Level II books which individually explore the technology systems of communication, construction, manufacturing, and energy, power, and transportation.

The book you are holding, *Exploring Communication Technology*, is one of the Level II publications in this series. It has been developed to give students technological literacy, career exploration, and problem-solving skills dealing with the communication industries.

Every effort has been made to make this publication basic, readable, and by all means, usable. Three vital parts of instruction have been intentionally omitted from the publication: motivation, personalization, and localization. These areas are left to the individual instructors who should capitalize on them. Only then will these publications become a vital part of the teaching-learning process.

Harley Schlichting, Chairman
Board of Directors
Mid-America Vocational
Curriculum Consortium

Greg Pierce
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Thanks are also extended to **Mary Kellum,** MAVCC Publication Specialist, for her assistance with the editing of this book, as well as the coordination of the entire project.

USE OF THIS PUBLICATION

Instructional Units

Exploring Communication Technology contains seven units of instruction. Each instructional unit includes some or all of the basic components of a unit of instruction; performance objectives, suggested activities for teachers and students, information sheets, assignment sheets, job sheets, visual aids, tests, and answers to the tests. Units are planned for more than one lesson or class period of instruction.

Careful study of each instructional unit by the teacher will help to determine:

A. The amount of material that can be covered in each class period
B. The skills which must be demonstrated

    1. Supplies needed
    2. Equipment needed
    3. Amount of practice needed
    4. Amount of class time needed for demonstrations

C. Supplementary materials such as pamphlets or filmstrips that must be ordered
D. Resource people who must be contacted

Objectives

Each unit of instruction is based on performance objectives. These objectives state the goals of the course, thus providing a sense of direction and accomplishment for the student.

Performance objectives are stated in two forms: unit objectives, stating the subject matter to be covered in a unit of instruction; and specific objectives, stating the student performance necessary to reach the unit objective.

Since the objectives of the unit provide direction for the teaching-learning process, it is important for the teacher and students to have a common understanding of the intent of the objectives. A limited number of performance terms have been used in the objectives for this curriculum to assist in promoting the effectiveness of the communication among all individuals using the materials.

Reading of the objectives by the student should be followed by a class discussion to answer any questions concerning performance requirements for each instructional unit.

Teachers should feel free to add objectives which will fit the material to the needs of the students and community. When teachers add objectives, they should remember to supply the needed information, assignment and/or job sheets, and criterion tests.

Suggested Activities for the Instructor

Each unit of instruction has a suggested activities sheet outlining steps to follow in accomplishing specific objectives. Duties of instructors will vary according to the particular unit; however, for best use of the material they should include the following: provide students with objective sheet, information sheet, assignment sheets, and job sheets; preview filmstrips, make transparencies, and arrange for resource materials and people; discuss unit and specific objectives and information sheet; give test. Teachers are encouraged to use any additional instructional activities and teaching methods to aid students in accomplishing the objectives.

Information Sheets

Information sheets provide content essential for meeting the cognitive (knowledge) objectives in the unit. The teacher will find that the information sheets serve as an excellent guide for presenting the background knowledge necessary to develop the skill specified in the unit objective.

Students should read the information sheets before the information is discussed in class. Students may take additional notes on the information sheets.

Transparency Masters

Transparency masters provide information in a special way. The students may see as well as hear the material being presented, thus reinforcing the learning process. Transparencies may present new information or they may reinforce information presented in the information sheets. They are particularly effective when identification is necessary.

Transparencies should be made and placed in the notebook where they will be immediately available for use. Transparencies direct the class's attention to the topic of discussion. They should be left on the screen only when topics shown are under discussion.

Assignment Sheets

Assignment sheets give direction to study and furnish practice for paper and pencil activities to develop the knowledge which is a necessary prerequisite to skill development. These may be given to the student for completion in class or used for homework assignments. Answer sheets are provided which may be used by the student and/or teacher for checking student progress.

Job Sheets

Job sheets are an important segment of each unit. The instructor should be able to demonstrate the skills outlined in the job sheets. Procedures outlined in the job sheets give direction to the skill being taught and allow both student and teacher to check student progress toward the accomplishment of the skill. Job sheets provide a ready outline for students to follow if they have missed a demonstration. Job sheets also furnish potential employers with a picture of the skills being taught and the performances which might reasonably be expected from a person who has had this training.

Test and Evaluation

Paper-pencil and performance tests have been constructed to measure student achievement of each objective listed in the unit of instruction. Individual test items may be pulled out and used as a short test to determine student achievement of a particular objective. This kind of testing may be used as a daily quiz and will help the teacher spot difficulties being encountered by students in their efforts to accomplish the unit objective. Test items for objectives added by the teacher should be constructed and added to the test.

Test Answers

Test answers are provided for each unit. These may be used by the teacher and/or student for checking student achievement of the objectives.

EXPLORING COMMUNICATION TECHNOLOGY

INSTRUCTIONAL TASK ANALYSIS

PRACTICAL APPLICATION: What The Student Should Be Able to Do (Psychomotor)	RELATED INFORMATION: What the Student Should Know (Cognitive)
UNIT I: INTRODUCTION TO COMMUNICATION	
	1. Terms and definitions
	2. Communication technological discoveries
	3. Types of communication
	4. Goals of communication
	5. Recent developments in communication
	6. Types of communication careers
	7. Safety practices for the laboratory
	8. Steps to be taken in case of an accident in the laboratory
9. Research the relationship between communication technology and industry	
10. Identify a recent development in communication technology	
11. Identify careers in the communication field	
12. Identify products that result from a communication process	

PRACTICAL APPLICATION: What The Student Should Be Able To Do (Psychomotor)	RELATED INFORMATION: What the Student Should Know (Cognitive)
UNIT II: VERBAL COMMUNICATION	
	1. Terms and definitions
	2. Types of communication
	3. Types of presentations
	4. Parts of a business letter
	5. Positive and negative body language signals
	6. Factors necessary for effective oral communication
	7. Ways to make a good first impression when giving a presentation
	8. Principal parts of an outline
	9. Types of visual aids
10. Write business letters	
11. Report observations of a day at school	
12. Prepare an outline for a three-minute speech	
13. Give a three-minute speech	
14. Evaluate a speech	
UNIT III: DESIGN AND SKETCHING	
	1. Terms and definitions
	2. Steps in the design process
	3. Elements of design
	4. Principles of design
	5. Types of sketches
	6. Correct freehand sketching techniques

PRACTICAL APPLICATION: What The Student Should Be Able To Do (Psychomotor)	RELATED INFORMATION: What the Student Should Know (Cognitive)
	7. Sketching circles and ellipses
	8. Basic steps for making a sketch
9. Make a simple sketch	
10. Complete a grid drawing	
11. Design a product	
12. Use a CAD system to design a product	
13. Redesign a product	

UNIT IV: DRAFTING

1. Terms and definitions
2. Manual drafting tools and equipment
3. Manual drafting aids
4. Types of drafting media
5. Standard and alternate sizes for drafting sheets
6. Good drafting habits
7. Types of machine drafting equipment
8. Computer-aided drafting (CAD) equipment
9. CAD terminology and definitions
10. Lines used in drafting
11. Basic systems of linear measurement
12. Factors that make a good drawing
13. Principal views used in orthographic projection
14. Types of pictorial drawings

PRACTICAL APPLICATION: What The Student Should Be Able To Do (Psychomotor)	RELATED INFORMATION: What the Student Should Know (Cognitive)
15. Sketch missing views	
16. Produce orthographic projections	
17. Produce isometric drawings	
18. Produce and print a drawing using CAD	

UNIT V: GRAPHIC REPRODUCTION

	1. Terms and definitions
	2. Basic types of graphic reproduction
	3. Common methods of copying
	4. Major printing processes
	5. Stages in the printing process
	6. Basic styles of type
	7. Variations of type
	8. Units for measuring type
	9. Hot and cold type composition
	10. Graphics laboratory safety rules
11. Identify type styles in printed material	
12. Design and reproduce a message using a copying process	
13. Design and prepare a message for a printing process	
14. Make a screen print	

PRACTICAL APPLICATION: What The Student Should Be Able To Do (Psychomotor)	RELATED INFORMATION: What the Student Should Know (Cognitive)
UNIT VI: PHOTOGRAPHY	
	1. Terms and definitions
	2. Basic parts of a camera
	3. How a camera works
	4. Basic types of cameras
	5. Common types of camera lenses
	6. How to care for a camera
	7. Types of light meters
	8. Basic types of film
	9. Modes of film
	10. How to take photographs
	11. Main steps in producing a photograph
	12. Types of film processing equipment and materials
	13. Chemicals used in developing black and white film
	14. General lab rules
15. Identify good characteristics of a photograph	
16. Take a series of black and white pictures	
17. Process black and white film	
18. Print a picture	

PRACTICAL APPLICATION: What The Student Should Be Able To Do (Psychomotor)	RELATED INFORMATION: What the Student Should Know (Cognitive)
UNIT VII: ELECTRONIC COMMUNICATION	
	1. Terms and definitions
	2. Electronic communication devices
	3. Emerging communication transmission technologies
	4. Steps in developing audio/audiovisual productions
	5. Developing production scripts for radio and television
	6. Composing a storyboard
	7. Terms and definitions related to radio production
	8. Terms and definitions related to television production
	9. Basic camera shots
10. Write a research paper	
11. Prepare and present a thirty-second radio commercial	
12. Prepare and record a one-minute television commercial	

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INTRODUCTION TO COMMUNICATION
UNIT I

UNIT OBJECTIVE

After completion of this unit, the student should be able to identify recent developments in communication and demonstrate safe work habits while participating in communication laboratory activities. Competencies will be demonstrated by completing the assignment sheets and the unit test with a minimum of 85 percent.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Match terms related to communications with the correct definitions.
2. Match communication technological discoveries with their appropriate ages.
3. Distinguish between the types of communication.
4. List goals of communication.
5. Select recent developments in communication.
6. Distinguish between different types of communication careers.
7. Select true statements concerning safety practices to be used in the laboratory.
8. Select true statements concerning the general steps to be taken in the case of an accident in the laboratory.
9. Research the relationship between communication technology and industry. (Assignment Sheet #1)

OBJECTIVE SHEET

10. Identify a recent development in communication technology. (Assignment Sheet #2)

11. Identify careers in the communication field. (Assignment Sheet #3)

12. Identify products that result from a communication process. (Assignment Sheet #4)

INTRODUCTION TO COMMUNICATION
UNIT I

SUGGESTED ACTIVITIES

A. Obtain additional materials and/or invite resource people to class to supplement/reinforce information provided in this unit of instruction.

(NOTE: This activity should be completed prior to the teaching of this unit.)

B. Make transparencies from the transparency masters included with this unit.

C. Provide students with objective sheet.

D. Discuss unit and specific objectives.

E. Provide students with information and assignment sheets.

F. Discuss information and assignment sheets.

(NOTE: Use the transparencies to enhance the information as needed.)

G. Integrate the following activities throughout the teaching of this unit:

1. Organize a class trip to a communication-related company.
2. Discuss how communication relates to the other three technology systems.
3. Present communication scenarios in which students must project the outcome.
4. Have students choose an early communication device and identify its present-day counterpart. Have them prepare models that compare the two.

   (NOTE: This may be used as an ongoing project.)
5. Set aside time during the week to allow students to discuss news items about communication systems or technology.
6. Discuss safety practices and regulations unique to your facility.
7. Make thorough and prompt reports of accidents.
8. Be aware of emotionally disturbed and accident-prone students.
9. Provide proper supervision in the classroom or laboratory at all times.
10. Provide proper instruction in the use of tools, machines, and equipment.
11. Keep a record of each student's safety training.

SUGGESTED ACTIVITIES

12. Use the AIASA competitive events guidelines for research paper format.

13. Develop and implement a student managed cleanup system.

14. Invite professionals to discuss their communication fields with the class.

15. Coordinate projects and class discussions with other teachers in English, science, etc.

16. Meet individually with students to evaluate their progress through this unit of instruction, and indicate to them possible areas for improvement.

H. Administer test.

I. Evaluate test.

J. Reteach if necessary.

REFERENCES USED IN DEVELOPING THIS UNIT

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SUGGESTED SUPPLEMENTAL RESOURCE

Film

Careers: Communications, color, 12 min., 1973, available from:
Doubleday Multimedia
1371 Reynolds Avenue
Irvine, CA 92705

INTRODUCTION TO COMMUNICATION
UNIT I

INFORMATION SHEET

I. **Terms and definitions**

A. Communication — A process by which information is exchanged between individuals or machines through a common system of signs, symbols, or behavior

B. Communication systems model — Four basic functions of every type of communication system

1. Input — The sender gathers necessary **resources** to develop a message.

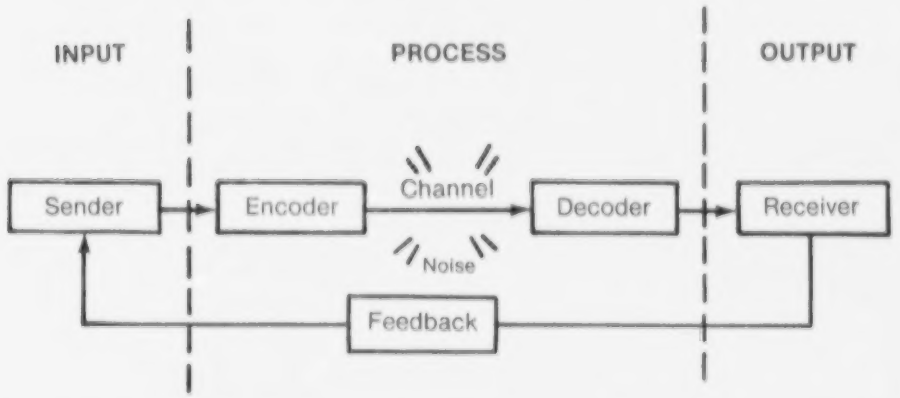
2. Process — All **actions** that actually produce the sender's message.

   Examples: Equipment (a pencil), material (paper), procedures (drafting, photography)

3. Output — The **completed message** sent to the receiver

4. Feedback — The receiver's **reaction** to the output; often the feedback is returned to the sender

FIGURE 1 — Communication Model



C. Communication technology — The tools, materials, and processes that people use to enhance their ability to communicate

D. Information Age — The present age of using computers to process data into usable information

INFORMATION SHEET

E. Peripheral hardware — Add-on computer devices which perform specific functions

Example: Plotters, printers, displays, input devices

F. Sender — One who sends a message

G. Message — Any communication between sender and receiver

H. Channel — The means through which a message is sent

I. Receiver — One who receives, or gets, a message

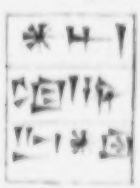
II. Communication technological discoveries

(NOTE: The following time line shows selected events in communication technology.)

A. Bronze Age (10,000 B.C.)

1. Hieroglyphics

2. Cuneiform writing (wedge-shaped characters)



B. Iron Age (1,000 B.C.)

1. Phoenician alphabet
2. Etruscan alphabet
3. Roman alphabet

C. Middle Ages (500 A.D.—1500 A.D.)

1. Use of ink and paper
2. Movable type
3. Gutenberg's printing press

INFORMATION SHEET

D. Industrial Age (1700 A.D.)

1. Metric system
2. Lithography

E. Machine Age (1800 A.D.)

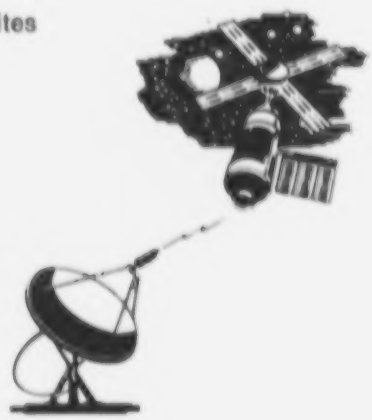
1. Telegraph (wire and wireless)
2. Telephone
3. Typewriter
4. Radio

F. Atomic Age (1900 A.D.)

1. Television
2. Sonar
3. Radar

G. Space Age

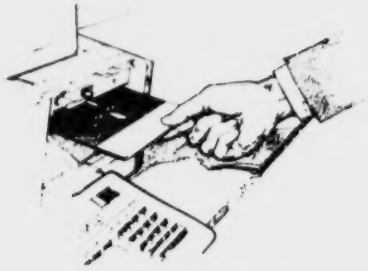
1. Polaroid camera
2. Long-playing records
3. Satellites



INFORMATION SHEET

H. Information Age

1. Transistors
2. Cable television
3. Lasers
4. Computers



III. **Types of communication systems** (Transparency 1)

A. Visual

1. Drawings and paintings
2. Drafting maps and illustrations
3. Photographs
4. Books, magazines, newspapers
5. Silent movies
6. Letters and memos
7. Billboards and signs
8. Computer monitors and print-outs

B. Audio

1. Telegraph
2. Telephone
3. Radio
4. Phonograph and compact disk recordings
5. Tape recordings
6. Voice

INFORMATION SHEET

C. Audiovisual

1. Television
2. Motion pictures (movies)
3. Theater
4. Videodisk and videocassette
5. Picture phones
6. Communication satellites

IV. Goals of communication

A. To give information to others

B. To obtain information from others

C. To express feelings

D. To solve problems through communication

E. To persuade others to change an attitude or behavior

V. Recent developments in communication

A. Videocassettes — Educational and entertaining audiovisual programming

B. Microcomputers — Less expensive "personal computers" for individualized entertainment and problem solving

C. Compact disk — Higher quality recorded sound. Recorded and played by laser. These disks have high capacity and never wear out.

D. Sophisticated phone systems

1. Cellular systems — Mobile phones that send and receive by radio waves
2. Picture phones — Users see as well as talk with each other

E. Computer-aided drafting and design (CADD) — Using computers and peripheral devices to facilitate the making of precise, detailed drawings in the drafting of new products

F. Electronic desktop publishing — Computer-based printing and publication

INFORMATION SHEET

G. Instant photography — Uses special camera and film to produce photos in about one minute; may also produce color slides

H. Hologram — A three-dimensional photography process produced by laser

VI. **Careers in the communication field** (Transparency 2)

A. Broadcasting careers

1. Actor or actress
2. Broadcast technician
3. Camera operator
4. Director
5. Disk jockey
6. Newscaster
7. Radio and television announcer

B. Computer careers

1. Computer operator
2. Computer programmer
3. Computer service technician
4. Electrical engineer
5. Systems analyst

C. Drafting and drafting related careers

1. Design drafter
2. Detail drafter
3. Drafter trainee
4. Senior drafter
5. Technical illustrator
6. Architect

INFORMATION SHEET

7. Engineer
8. Industrial designer
9. Teacher

D. Graphic communication careers

1. Bindery worker
2. Camera operator
3. Composer
4. Designer
5. Editor
6. Illustrator
7. Image assembler
8. Photographer
9. Platemaker
10. Press operator
11. Printing stripper
12. Production manager
13. Reporter
14. Writer

E. Photography careers

1. Commercial photographer
2. Free-lance photographer
3. Industrial photographer
4. Motion picture photographer
5. Photographic technician
6. Photojournalist
7. Portrait photographer
8. Stringer (part-time photojournalist)

INFORMATION SHEET

VII. Laboratory safety and management practices (Transparencies 3-6)

A. Observe all safety rules required by the instructor.

B. Dress properly for the job.

(NOTE: Avoid loose clothing and remove ties and jewelry when working in the lab. Use an apron or snug-fitting lab coat to protect clothing.)

C. Wear approved safety glasses.

D. Never run or engage in horseplay in the lab.

E. Use and store chemicals and solvents only as directed.

F. Use equipment only after the following:

1. You have been taught how to use it.
2. You have permission from your instructor.
3. All guards and safety devices are in place.

G. Know where the fire extinguisher is located in the lab and how to use it.

VIII. Steps to be followed in case of an accident in the laboratory

A. Get prompt attention for cuts, bruises, or other injuries.

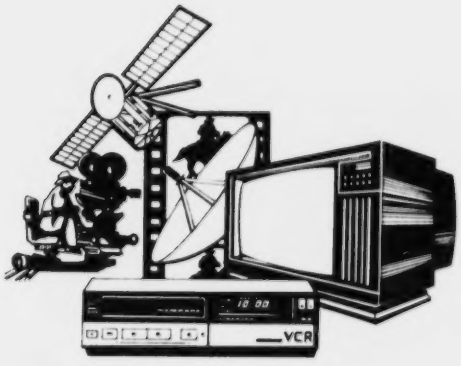
B. Report **all** accidents to your instructor, even small ones.

C. Follow school policies in the event of an accident.

Types of Communication

Visual Communication

Audio Communication



Audiovisual Communication

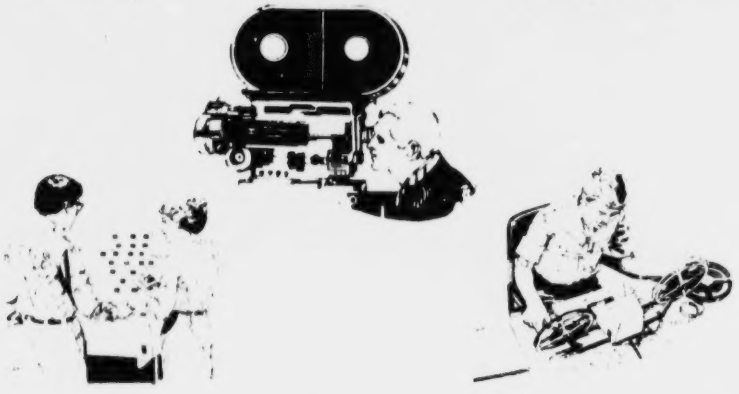
Communication Careers

Broadcasting

Computer

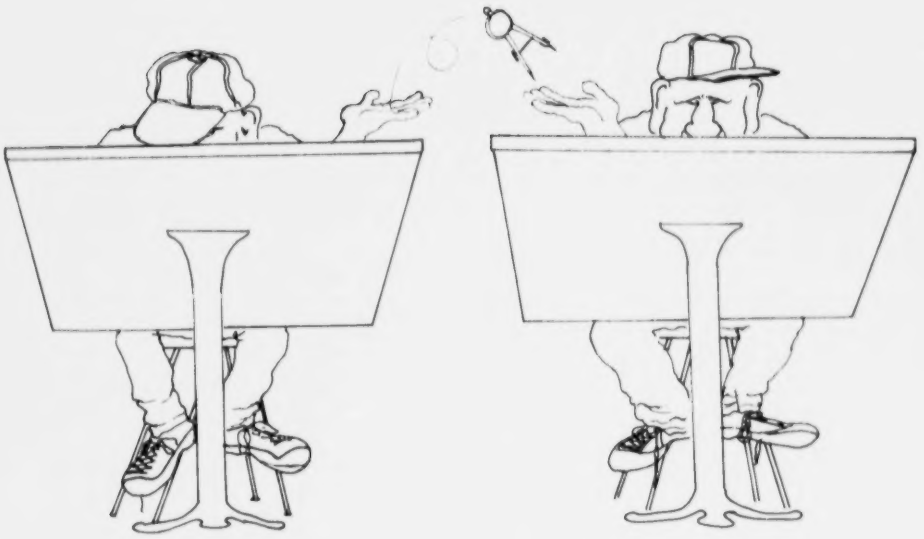
Drafting

Graphics



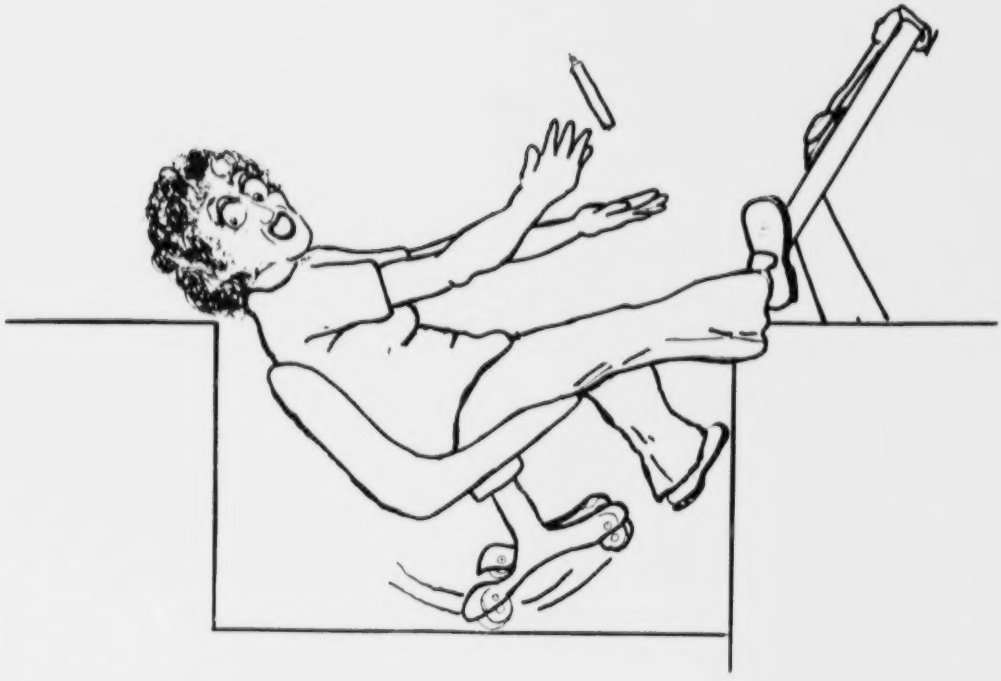
Photography

Handle Instruments Properly

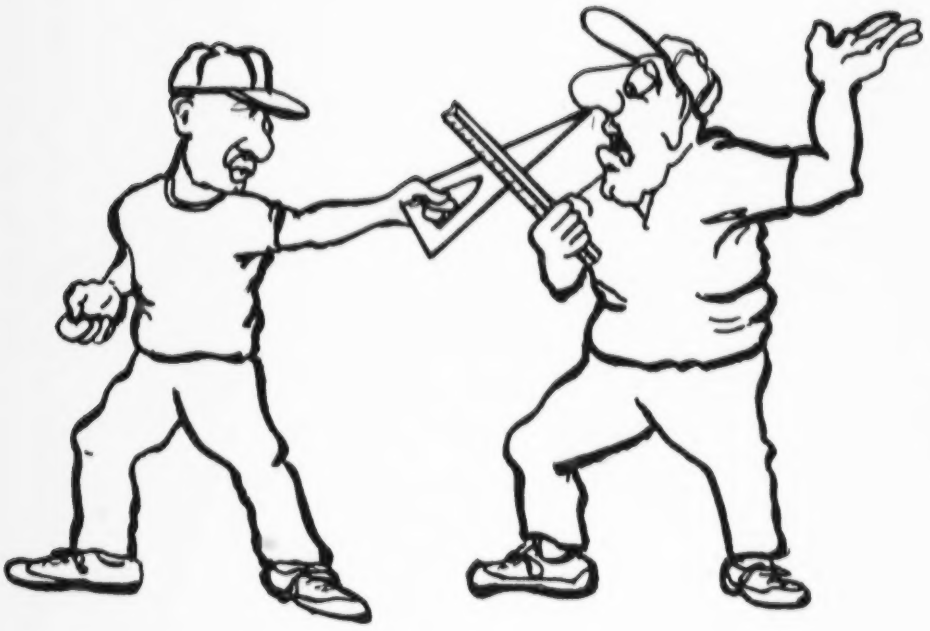


Handle Tools Properly

Keep All Chair Feet on Floor



Avoid Horseplay



INTRODUCTION TO COMMUNICATION
UNIT I

HANDOUT #1 — STEPS IN WRITING A RESEARCH PAPER

1. Select and limit the subject.
2. Prepare a working bibliography (a list of available sources).
3. Prepare a preliminary outline.
4. Read about subject and take notes.
5. Assemble notes and write final outline.
6. Write the first draft.
7. Write the revised final draft with footnotes and bibliography.

(NOTE: There are several formats to follow when preparing a research paper. Your instructor will assist you with this. All quotations, paraphrases, and other assistance must be acknowledged and footnoted properly.)

INTRODUCTION TO COMMUNICATION
UNIT I

ASSIGNMENT SHEET #1 — RESEARCH THE RELATIONSHIP BETWEEN COMMUNICATION TECHNOLOGY AND INDUSTRY

NAME _____ SCORE _____

Directions: Search magazines, newspapers, and pamphlets to find illustrations of different ways people use communication technology in industry. Choose one of the following ways to complete the assignment.

A. Each student contributes pictures of **different** forms of communication technology. Arrange pictures on a display board or in a scrap book.

B. Select a **single** form of communication technology and show how it is used.

C. Have a group discussion and compile a comprehensive list of ways people use technology to communicate.

D. Prepare a research paper according to your instructor's directions and the guidelines in Handout #1.

INTRODUCTION TO COMMUNICATION
UNIT I

ASSIGNMENT SHEET #2 — IDENTIFY A RECENT DEVELOPMENT IN TECHNOLOGY COMMUNICATION

NAME _____ SCORE _____

Directions: Look through newspapers and magazines or listen to newscasts. Find at least three articles or reports on recent developments in communication technology. Complete a News Item Form for each news item you locate. Appropriate forms are included with this assignment.

ASSIGNMENT SHEET #2

ASSIGNMENT SHEET #2

News Item Form

NAME _____ SCORE _____

Name of news item source: _____

_____

(newspaper, magazine, or newscast)

Title of news item: _____

_____

Date of publication or broadcast: _____

Brief summary of news item: _____

_____

_____

_____

_____

_____

_____

Your own ideas about the news item and impact you feel this will have: _____

_____

_____

_____

_____

_____

_____

_____

_____

ASSIGNMENT SHEET #2

ASSIGNMENT SHEET #2

News Item Form

NAME _____ SCORE _____

Name of news item source: _____

_____

(newspaper, magazine, or newscast)

Title of news item: _____

_____

Date of publication or broadcast: _____

Brief summary of news item: _____

_____

_____

_____

_____

_____

_____

Your own ideas about the news item and impact you feel this will have: _____

_____

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ASSIGNMENT SHEET #2

ASSIGNMENT SHEET #2

News Item Form

NAME _____ SCORE _____

Name of news item source: _____

_____

(newspaper, magazine, or newscast)

Title of news item: _____

_____

Date of publication or broadcast: _____

Brief summary of news item: _____

_____

_____

_____

_____

_____

_____

Your own ideas about the news item and impact you feel this will have: _____

_____

_____

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_____

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_____

INTRODUCTION TO COMMUNICATION
UNIT I

ASSIGNMENT SHEET #3 — IDENTIFY CAREERS IN THE COMMUNICATION FIELD

NAME _____ SCORE _____

Directions: Select a communication career you would like to explore. Find out the following information about that career:

1. What are the responsibilities of the career?
2. What education is required for the career?
3. Where can you get the required training?
4. What are the future possibilities for the career?

Use the following resources for your research:

1. A professional in that career
2. School or career counselor
3. Career reference books or guides
4. Technical schools

Have your instructor evaluate your report.

INTRODUCTION TO COMMUNICATION
UNIT I

ASSIGNMENT SHEET #4 — IDENTIFY PRODUCTS THAT RESULT FROM A COMMUNICATIONS PROCESS

NAME _____ SCORE _____

Directions: Look at the career you researched in Assignment Sheet #3. Decide what products are made by those in that career. Answer the following questions.

1. What is the product's name? _____
2. Who uses the product? _____

   _____
3. How does the product use or need the following industries?
   a. Construction _____

      _____

      _____
   b. Manufacturing _____

      _____

      _____
   c. Transportation _____

      _____

      _____
4. How is the product used by the following industries?
   a. Construction _____

      _____

      _____
   b. Manufacturing _____

      _____

      _____
   c. Transportation _____

      _____

      _____

INTRODUCTION TO COMMUNICATION
UNIT I

NAME _____ SCORE _____

TEST

1. Match terms on the right with their correct definitions.

_____a.	The completed message sent to the receiver	1. Information age
_____b.	The tools, materials, and processes that people use to enhance their ability to communicate	2. Peripheral hardware
_____c.	A process by which information is exchanged between individuals or machines through a common system of signs, symbols, or behavior	3. Feedback
_____d.	The receiver's reaction to the output; often is returned to the sender	4. Communication technology
_____e.	All actions that actually produce the sender's message	5. Communication
_____f.	Four basic functions of every type of communication system	6. Output
_____g.	The sender gathers necessary resources to develop a message	7. Process
_____h.	Add-on computer devices which perform specific functions	8. Communication systems model
_____i.	The present age of using computers to process data into useful information	9. Input
_____j.	The means through which a message is sent	10. Receiver
_____k.	One who gets a message	11. Sender
_____l.	One who sends a message	12. Message
_____m.	Any communication between sender and receiver	13. Channel

TEST

2. Match communication technological discoveries with their appropriate ages.

_____a.	Cable television	1. Information Age
_____b.	Roman alphabet	2. Machine Age
_____c.	Metric system	3. Bronze Age
_____d.	Polaroid camera	4. Space Age
_____e.	Lasers	5. Iron Age
_____f.	Computers	6. Atomic Age
_____g.	Television	7. Industrial Age
_____h.	Radar	8. Middle Ages
_____i.	Hieroglyphics	
_____j.	Use of ink and paper	
_____k.	Telephone	
_____l.	Gutenberg's printing press	
_____m.	Radio	

3. Distinguish between the three types of communication by placing the following letters next to the correct examples:

V — Visual
A — Audio
AV — Audiovisual

_____a. Television

_____b. Videocassette

_____c. Books, magazines, newspapers

_____d. Radio

_____e. Telephone

_____f. Photographs

_____g. Compact disk recordings

TEST

_____h. Theater

_____i. Letters and memos

_____j. Drafting maps and illustrations

4. List three goals of communication.

a. _____

b. _____

c. _____

5. Select recent developments in communication by placing an "X" before the correct terms.

_____a. Movable type

_____b. Picture phones

_____c. Metric system

_____d. Compact disk

_____e. Videocassette

_____f. Hologram

_____g. Radio

_____h. Microcomputers

_____i. Electronic desktop publishing

_____j. Photography

_____k. Instant photography

_____l. Long playing records

_____m. Cellular phone system

TEST

6. Distinguish between five types of communication careers by placing the following letters next to the correct examples:

B — Broadcasting careers
C — Computer careers
D — Drafting related careers
G — Graphics careers
P — Photographic careers

_____a. Photojournalist

_____b. Platemaker

_____c. Editor

_____d. Actor or actress

_____e. Computer programmer

_____f. Architect

_____g. Reporter

_____h. Industrial photographer

_____i. Designer

_____j. System analyst

_____k. Technical illustrator

_____l. Bindery worker

_____m. Disk jockey

_____n. Newscaster

_____o. Electrical engineer

7. Select true statements concerning safety practices to be used in the laboratory by placing an "X" before the true statements and an "O" before the false statements.

_____a. Know where the fire extinguisher is located in the lab.

_____b. Act any way you wish in the communication laboratory.

_____c. Observe all safety rules required by the instructor.

_____d. Dress properly for the job.

TEST

_____e. Wear approved safety glasses.

_____f. Leave your area messy at the end of your work period.

_____g. It is not necessary to report safety hazards.

_____h. Never run or engage in horseplay in the lab.

_____i. Use and store chemicals and solvents only as directed.

8. Select true statements concerning the steps to follow in case of an accident in the laboratory by placing an "X" before the true statements and an "O" before the false statements.

_____a. Report only large accidents.

_____b. Report all accidents to your instructor, even small ones.

_____c. Get prompt attention for cuts, bruises, or other injuries.

_____d. Follow school policies in the event of an accident.

(NOTE: If the following activities have not been accomplished prior to the test, ask your instructor when they should be completed.)

9. Research the relationship between communication technology and industry. (Assignment Sheet #1)

10. Identify a recent development in communication technology. (Assignment Sheet #2)

11. Identify careers in the communication field. (Assignment Sheet #3)

12. Identify products that result from a communication process. (Assignment Sheet #4)

INTRODUCTION TO COMMUNICATION
UNIT I

ANSWERS TO TEST

1.
a.	6	f.	8	j.	13
b.	4	g.	9	k.	10
c.	5	h.	2	l.	11
d.	3	i.	1	m.	12
e.	7				

2.
a.	1	f.	1	j.	8
b.	5	g.	6	k.	2
c.	7	h.	6	l.	8
d.	4	i.	3	m.	2
e.	1				

3.
a. AV
b. AV
c. V
d. A
e. A
f. V
g. A
h. AV
i. V
j. V

4. Any three of the following
   a. To give information to others
   b. To obtain information from others
   c. To express feelings
   d. To solve problems through communication
   e. To persuade others to change an attitude or behavior

5.
a.	O	f.	X	k.	X
b.	X	g.	O	l.	O
c.	O	h.	X	m.	X
d.	X	i.	X		
e.	X	j.	O		

6.
a.	P	f.	D	k.	D
b.	G	g.	G	l.	G
c.	G	h.	P	m.	B
d.	B	i.	G	n.	B
e.	C	j.	C	o.	C

ANSWERS TO TEST

7.
a.	X		f.	O
b.	O		g.	O
c.	X		h.	X
d.	X		i.	X
e.	X			

8.
a.	O
b.	X
c.	X
d.	X

9.-12. Evaluated to the satisfaction of the instructor

VERBAL COMMUNICATION
UNIT II

UNIT OBJECTIVE

After completion of this unit, the student should be able to effectively practice verbal communication skills by writing business letters and making a presentation. Competencies will be demonstrated by completing the assignment sheets and the unit test with a minimum of 85 percent.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Match terms related to verbal communication with the correct definitions.
2. Distinguish between the types of communication.
3. Match types of presentations with the correct descriptions.
4. Identify parts of a business letter.
5. Distinguish between positive and negative body language signals.
6. Select true statements concerning factors necessary for effective oral communication.
7. Select from a list ways to make a good first impression when giving a presentation.
8. Arrange in order the principal parts of an outline.
9. Identify types of visual aids.

OBJECTIVE SHEET

10. Write business letters. (Assignment Sheet #1)
11. Report observations of a day at school. (Assignment Sheet #2)
12. Prepare an outline for a three-minute speech. (Assignment Sheet #3)
13. Give a three-minute speech. (Assignment Sheet #4)
14. Evaluate a speech. (Assignment Sheet #5)

VERBAL COMMUNICATION
UNIT II

SUGGESTED ACTIVITIES

A. Obtain additional materials and/or invite resource people to class to supplement/reinforce information provided in this unit of instruction.

(NOTE: This activity should be completed prior to the teaching of this unit.)

B. Make transparencies from the transparency masters included with this unit.

C. Provide students with objective sheet.

D. Discuss unit and specific objectives.

E. Provide students with information and assignment sheets.

F. Discuss information and assignment sheets.

(NOTE: Use the transparencies to enhance the information as needed.)

G. Integrate the following activities throughout the teaching of this unit:

1. Have the students use a word processor if possible when preparing their letters in Assignment Sheet #1.

2. Assist students in selecting a new communication product or system in Assignment Sheet #1, Part B. The information that they are requesting will be used later to write a research paper. Provide addresses of manufacturers or show students how to find their addresses using your library's indexes, registers, and directories.

3. Assist students in selecting appropriate topics for their 3-minute speeches in Assignment Sheets #2 and #3.

4. Coordinate this unit with the speech and language arts instructors at your educational facility.

5. Show examples of outlines for developing speeches.

6. Show samples of business letters and memos.

7. Listed are ideas for technology education research topics.

   a. Fiberoptics

   b. Microelectronics

   c. Lasers

   d. Numerical and computer control systems

   e. Computer-aided drafting

SUGGESTED ACTIVITIES

f. Computer-aided design

g. Computer-aided manufacturing

h. Robotics

i. Communication methods and systems

j. Manufacturing methods and systems

k. Transportation: Past, present, and future

l. Construction: Past, present, and future

m. Alternative energy

n. Technology and its impact on society (positive/negative)

o. Manufacturing and our environment

p. Technology and economics

q. Materials handling

r. Safety and ergonomics (OSHA)

s. Industrial management

t. Space technology

u. Home environment safety and health (radon, insulation)

v. Marketing the product (ways to/opportunities/jobs)

w. The working place (increasing production/employee happiness)

x. The small business (how to get started/how to stay "Alive")

y. Ethics in the workplace (space industry/chemical companies)

z. Handicapped personnel in the workplace (opportunities)

aa. Unions

8. Use a video tape recorder for evaluating speeches.

9. Have students demonstrate common positive and negative body signals.

10. Use this unit to develop AIASA competitive events for speaking.

11. Meet individually with students to evaluate their progress through this unit of instruction, and indicate to them possible areas for improvement.

SUGGESTED ACTIVITIES

H. Administer test.

I. Evaluate test.

J. Reteach if necessary.

REFERENCES USED IN DEVELOPING THIS UNIT

A. *Competitive Events Guidelines.* National AIASA, Reston, VA, 1985.

B. Hughey, Jim D. and Arlee W. Johnson. *Speech Communication: Foundations and Challenges.* New York: Macmillan Publishing Co., Inc., 1975.

C. Kimbrell, Grady and Ben S. Vineyard. *Succeeding in the World of Work.* Encino, CA: Glencoe Publishing Co., 1981.

D. Markman, Roberta H. and Marie L. Waddell. *Ten Steps in Writing the Research Paper.* Woodbury, NY: Barron's Educational Series, Inc., 1971.

E. *VICA: Learn, Grow, Become.* Stillwater, OK: CIMC, Oklahoma State Department of Vocational Technical Education.

F. Warren, Thomas L. *Technical Communication: An Outline.* Totowa, NJ: Littlefield, Adams & Co., 1978.

SUGGESTED SUPPLEMENTAL RESOURCES

Films

A. *Person to Person: Making Communications,* color, 11 min., 1972

Sandler Institutional Films
1272 S. Bronson Avenue
Los Angeles, CA 90019
(213) 734-6595

B. *Written Communications,* color, 28 min. 1976

C. *Oral Communications,* color, 28 min., 1976

B. and C. are available from

National A-V Center
General Service Admin., Sect. FF
Washington, D.C. 20409
(301) 763-1896

VERBAL COMMUNICATION
UNIT II

INFORMATION SHEET

I. Terms and definitions related to communication

A. Body language — The gestures, mannerisms, body movements, bearing, and physical appearance of an individual which communicate information and attitudes to the receiver

B. Communication — The process by which information is exchanged through a common system of symbols, signs, or behavior

C. Enunciation — The process of speaking each syllable clearly and separately

D. Feedback — The return of information to the source after an action or process, primarily to evaluate or correct the source

E. Feelings — Personal, subjective responses to a person or situation

Examples: Sadness, joy, love, anxiety, anger, respect

F. Hearing — The physical process of receiving sounds

G. Inflection — The use of the voice to alter the meaning of a spoken message

H. Jargon — Special terms or phrases used to describe something in a particular field

Examples: Legal jargon, computer jargon

I. Listening — Hearing and interpreting sounds

J. Previewing — Reading only part of a document, report, or other material that outlines or summarizes the content

K. Process — A series of actions or operations

L. Pronunciation — Refers to the way a word is said

M. Résumé — Short account of one's career and qualifications prepared by person applying for a position

N. Skimming — Reading through something very quickly, picking out the key points

INFORMATION SHEET

II. **Types of communication** (Transparency 1)

A. Verbal — Communication using **words**

1. Oral — Words are spoken aloud. This type of communication depends on the ability to speak and hear.

   Examples: Conversations, speeches

2. Written — Words are written. This type of communication depends on the abilities to read and write.

   Examples: Books, memos, letters, charts, maps

B. Nonverbal — Communication sent in ways **other than by words.** Depends on the five basic senses.

Examples: Body language, traffic signs, drafting symbols, colors, smells, tastes, voice inflection and tone (not the words themselves), artistic works such as art, music (without lyrics), sculpture, and mime

III. **Types of presentations**

A. Demonstration — Presentation illustrating the step-by-step procedure for performing a task or assignment

B. Illustrated talk — Presentation using objects and visual aids to assist in making a point

C. Prepared speech — Formal verbal presentation following a logical sequence

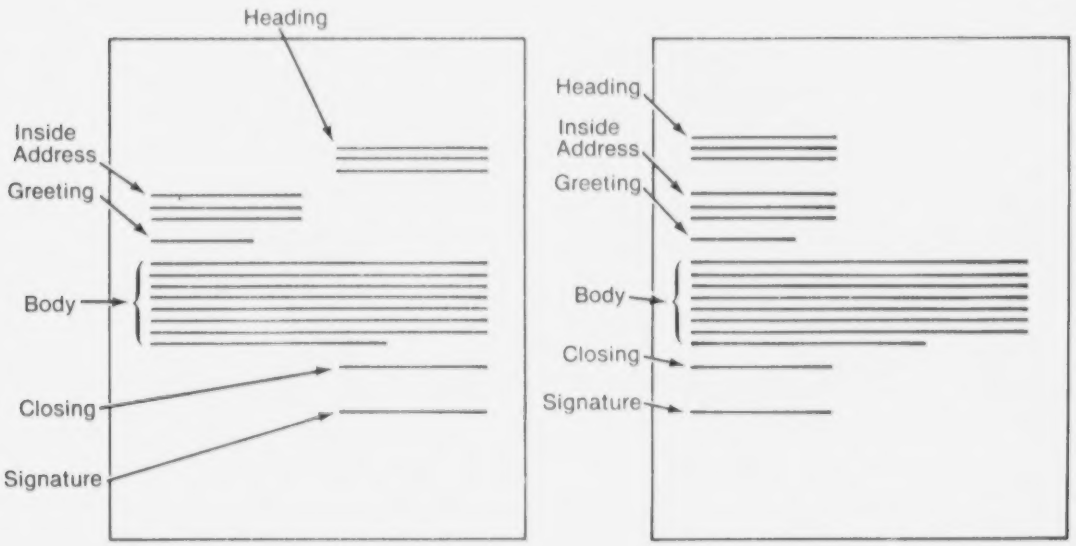
D. Panel discussion — Presentation in which three or more individuals discuss a topic from different points of view

E. Extemporaneous speech — Speech delivered on an assigned topic with a minimum of advance preparation

INFORMATION SHEET

IV. Parts of a business letter (written communication)

FIGURE 2



A. Heading — Lines that tell where and when letter was written

B. Inside address — Title of respect, name, and address of person to whom letter is written

C. Greeting — Line that greets person to whom letter is written

(NOTE: In a business letter, the greeting is always followed by a colon.)

Example: Dear Mr. Sloan:

D. Body — Paragraph or paragraphs containing message of letter

E. Closing — Courteous ending of letter

Example: Sincerely yours,

(NOTE: Capitalize only the first word in closing. Follow the closing with a comma.)

F. Signature — Handwritten name of person who writes letter

(NOTE: Signature should be written in black ink even if the rest of the letter is typed.)

INFORMATION SHEET

V. **Body language signals**

(NOTE: Body language as well as voice inflections and tone provide clues to one's feelings and attitudes, and will either reinforce or contradict what is said verbally. This applies to both listening and hearing.)

A. Positive gestures, expressions, and stances (Transparency 2)

1. Eye contact — Attentive, listening
2. Smiling — Agreement, pleasure, humor
3. Open stance (arms unfolded, legs uncrossed) — Friendly, receptive, undefensive
4. Hand stroking chin — Thoughtful consideration
5. Sitting slightly forward in chair — Attentive
6. Leaning slightly forward toward person — Attentive, involved
7. Head nodding up and down — Agreement, support

B. Negative gestures, expressions, and stances (Transparency 3)

1. Tapping fingers, cracking knuckles, wringing hands, tugging hair — Lack of confidence, uneasiness, boredom, nervousness
2. Moving around in chair — Restlessness
3. Clenched fist — Hostility, lack of acceptance
4. Arms folded tightly high on chest — Closed, defensive, disagreement, discomfort, withdrawing from conversation
5. Side of head leaning on hand — Boredom or tiredness
6. Raised eyebrows — Surprise, doubt, indifference
7. Scowl or frown — Disapproval
8. Lips pressed tightly — Anger, determination
9. Turning head from side to side — Disagreement

(NOTE: There are *many* others.)

INFORMATION SHEET

VI. Factors necessary for effective oral communication

A. Good listening

1. Good listening is basic to effective oral communication and is as important as speaking.

2. Listening is an art which demands a conscious effort on the part of the listener.

3. Listen closely to what the person is saying, and observe closely for nonverbal communication (body language).

   (NOTE: Nonverbal communications are often more honest and more revealing than verbal communication.)

4. Don't pretend to listen — To pay attention is a compliment, to pretend and then give yourself away by unnecessary questions is an insult.

5. Don't interrupt.

6. Don't get so involved in thinking about your reply that you miss or confuse information.

7. Be objective and open-minded in your listening in order to gain as much information as possible.

   (NOTE: This is especially important when the speaker is someone that you do not like or when the speaker is sending you messages that you do not want to receive, such as information that contradicts previous information, ideas, or values.)

8. Use body language that shows you are interested in what the speaker is saying. Physically show that you are listening.

INFORMATION SHEET

B. Good speaking

1. Speaking conveys words as well as personality.

2. Plan what you are going to say.

   (NOTE: Rambling and groping for words tells the listener that what you are saying is unimportant.)

3. Make sure your message is relevant to the listener.

4. State your ideas in as simple of terms as possible, without speaking "down" to your listener. Don't use jargon unfamiliar to the listener.

5. Be sincere.

   (NOTE: If the listener detects any phoniness in your message, you will lose your credibility as a speaker.)

6. Enunciate properly; don't slur your words.

7. Use body language that shows you are interested in your listeners and that you are confident that what you are saying is important to you and to them.

8. Use a voice (including its tone and pitch) that is acceptable to the listener.

   (NOTE: Voices that are excessively loud, high-pitched, monotoned, or nasal can be irritating to the listen who will tune you out or discount your message because of your delivery. If you discover that your voice has offending, undesirable characteristics, take the time to correct them since they affect your ability to communicate.)

C. Conducive climate

1. Climate involves location, timing, atmosphere, and the physical and emotional states of the sender and receiver.

2. The location should be away from noise and unnecessary interruptions.

3. The location often lends a particular atmosphere to communication.

   Examples: An office or classroom usually has a business-like atmosphere, a conversation over lunch may have a casual atmosphere.

INFORMATION SHEET

4. The physical and emotional states of the sender and the receiver influence communication.

   Example: A person who is mad or upset is usually not ready to listen to new ideas.

VII. Ways to make a good first impression when giving a presentation

A. Be neatly groomed.

B. Let all important actions, objects, and aids be seen clearly.

C. Be enthusiastic and confident.

D. Recognize that some fear is normal. Do not get too upset.

E. Speak clearly and in a pleasant tone of voice.

VIII. Principal parts of an outline (Transparency 4)

(NOTE: Using an outline is an excellent way to plan and organize a presentation.)

A. Introduction — Beginning of a presentation; should attract and motivate audience.

B. Body — Central theme of presentation; carries main idea.

C. Conclusion — Repeats or summarizes the main point of the presentation or asks for action.

INFORMATION SHEET

IX. Types of visual aids

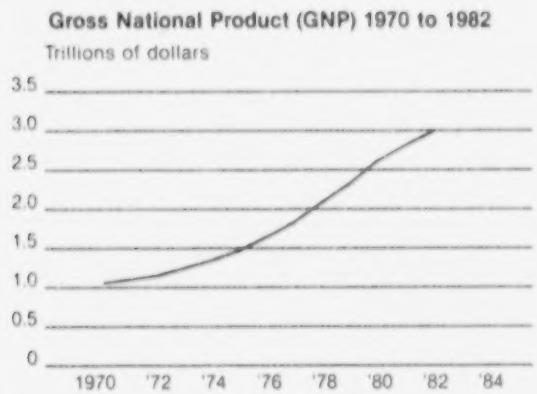
(NOTE: Use visual aids to emphasize key points and add validity. Use them to improve your presentation, not as a substitute for it.)

A. Models and actual objects

FIGURE 3

B. Charts and graphs

FIGURE 4

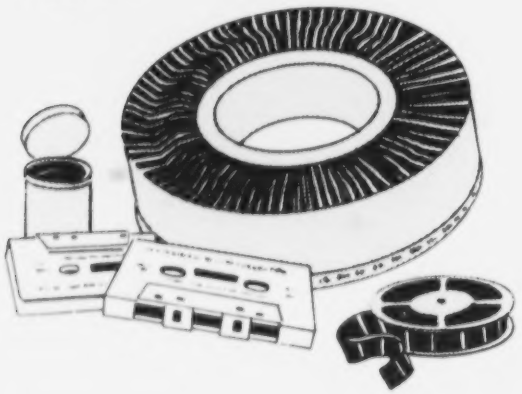


Source: U.S. Bureau of the Census.

INFORMATION SHEET

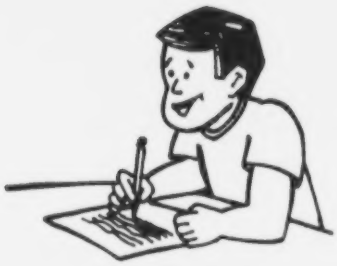
C. Films, tapes, and slides

FIGURE 5



Types of Communication

Oral



Written

Verbal Communication

Hearing

Seeing

Smelling

Feeling

Tasting

Nonverbal Communication

Positive Body Language

Negative Body Languge

An Outline

I. INTRODUCTION

II. BODY

A. First main point

1. Subpoint #1
2. Subpoint #2

B. Second main point

1. Subpoint #1
2. Subpoint #2

III. CONCLUSION

VERBAL COMMUNICATION
UNIT II

ASSIGNMENT SHEET #1 — WRITE BUSINESS LETTERS

NAME _____ SCORE _____

Read and study this business letter. Use the letter as a model when you write your own business letters on the following pages.

1852 South B Street
Anchorage, AK 99509
February 22, 1987

Mrs. Janice Brown
Public Information Officer
Department H
Greyhound Highway Tours
444 Omaha Street
Clinton, NJ 08936

Dear Ms. Brown:

I am planning a summer vacation that will include touring the west coast states. I am particularly interested in tours of the Big Sur and Los Angeles areas of California. Please send me motel and state park information, as well as maps and travel folders for your tours in the states of Washington, Oregon, and California.

Thank you for your time and attention.

Sincerely,

Jane Smith

Jane Smith

ASSIGNMENT SHEET #1

PART A — Practice letters

1. Write a letter to Mr. John Doe, publicity assistant, U.S. Lumber Company, Avenue X, Jonesville, Pennsylvania 00000; request blueprints for a toolhouse or a utility shed. Turn in this practice letter to your instructor. Do not mail.

2. Write a letter to Ms. Mary Smith, catalog sales manager, Briggs Machine Corporation in Smithville, Wisconsin 00000; order a crankshaft, number 63785, for a lawnmower. Turn in to your instructor. Do not mail.

PART B — Actual letter

Write an actual letter to a manufacturer of a new communication technology system or product. Obtain the address from your instructor or from your library's indexes or directories of American manufacturers.

Request product literature, specifications, and cost. You may wish to explain that you will be writing a research paper on this product or system for your technology education class.

After your instructor approves the rough copy of your letter, type or write neatly in ink, make a copy of the letter for your record, and mail it.

(NOTE: Your letter must follow one of the formats shown in the information sheet. It must be legible and clearly written.)

VERBAL COMMUNICATION
UNIT II

ASSIGNMENT SHEET #2 — REPORT OBSERVATIONS OF A DAY AT SCHOOL

NAME _____ SCORE _____

Directions:

A. Survey your classes for the day and identify crutches the students use.

Examples: "You know?," "uh," "Know what I mean?," "um," etc.

List as many as possible here.

_____

_____

_____

_____

_____

B. Find five examples of body language used by people you have talked with today. Did they enhance or interfere with the message?

1. _____
2. _____
3. _____
4. _____
5. _____

VERBAL COMMUNICATION
UNIT II

ASSIGNMENT SHEET #3 — PREPARE AN OUTLINE FOR A THREE-MINUTE SPEECH

NAME _____ SCORE _____

Directions: Prepare an outline for a three-minute speech keeping in mind the three principal parts of an outline: introduction, body, and conclusion.

Your speech may be a demonstration or summary of a new communication process or product, a persuasive speech to convince your fellow students to do something, or a report about your class or student organization to a local civic organization. There are many other subjects that may be approved by your instructor.

Review your subject and start collecting information. Prepare visual aids if necessary. Prepare a bibliography of sources as directed by instructor.

After you have reviewed the source material, outline your speech using the space below and on the back of this page. Have your instructor evaluate the completed outline.

Topic: _____

List of Resources Used: _____

_____

_____

_____

Outline

_____

_____

_____

_____

_____

_____

_____

ASSIGNMENT SHEET #3

VERBAL COMMUNICATION
UNIT II

ASSIGNMENT SHEET #4 — GIVE A THREE-MINUTE SPEECH

NAME _____ SCORE _____

Directions: The time has arrived for you to prepare the final draft of your speech. Using Assignment Sheet #2 as your rough draft, rewrite your speech making the introduction, body, and conclusion fit together. Review the speech closely to make sure it flows. Rework any unfavorable words, unclear points, or incomplete statements.

The following points may assist you:

- Study and restudy your speech. Make sure that you know your speech; memorize it if necessary.

  (NOTE: A good way to memorize your speech is by reading it aloud several times.)

- Practice your speech in front of a mirror. This will allow you to practice the use of gestures.

- Record your speech and play it back. This will give you an opportunity to hear how you sound.

- You will be judged using the following criteria:

  — Topic organization ..... 40 pts max
  (clear and orderly, etc)

  — Developing introduction ..... 20 pts max
  (interest and appeal, etc)

  — Topic discussion ..... 10 pts max
  (factual support, etc)

  — Conclusion ..... 10 pts max
  (summary and appeal, etc)

  — Poise ..... 10 pts max
  (confidence, body control, posture, etc)

  — Language ..... 10 pts max
  (correct grammar, clarity, etc)

  (NOTE: 1 point will be deducted from the total for each 10 second interval over 5 minutes or under 3 minutes. If no bibliography is handed in, 10 points will be deducted.)

ASSIGNMENT SHEET #4

Now that you have studied your speech, you are ready to prepare your delivery. The following information will assist you in preparing your delivery.

Keys to Success

Know Your Audience

This means more than names. Get as much background information as possible before you present your speech to them. What are their needs, interests, and experiences? How can you make your speech interesting to them?

Know Your Subject

The audience will have confidence in you only as you demonstrate your knowledge of the subject. Keep informed of the latest techniques and knowledge.

Be Prepared

Have a clear, specific purpose for each presentation. Introduce each with a preview. Present your points one at a time and in logical order. Keep related ideas together. Keep language simple and sentences short. When technical terms are used, introduce them gradually and explain each fully. Try to anticipate any questions that they might want answered.

Control Your Presentation

Set your pace to match the difficulty of the material. Plan your time. Do not rush to finish. Rushing makes you seem nervous, and important parts of your speech may not be clear. Do not be afraid to repeat for emphasis. Use humorous stories or comments to add interest.

Make Your Presentation Effective

When demonstrating, first show the whole operation briefly; then show it one step at a time, explaining as you go along. Emphasize key points. Make full use of instructional aids to improve teaching. Use questions to guide your own teaching and to check participant progress. Ask questions first and then indicate the person to answer.

Motivate and Maintain Interest

Show enthusiasm. Use variety in your presentation. Make your speaking personal. Help the audience see future uses of what they learn.

Use Your Voice Wisely

Speak clearly and loudly enough so that all may hear. Speak slowly enough for meanings to be grasped. It is better to cover less and cover it well. A little variation in your voice will avoid monotony. Talk to the audience, not to the window or the chalkboard.

VERBAL COMMUNICATION
UNIT II

ASSIGNMENT SHEET #5 — EVALUATE A SPEECH

NAME _____ SCORE _____

Directions: The evaluation process will be used by you and the instructor to evaluate other students' speeches. Answer the following questions **or** use the speech rating sheet on the following page.

Poor			Average		Excellent	
0	1	2	3	4	5	1. Was the speech the correct length?
0	1	2	3	4	5	2. Did the speech follow a logical sequence?
0	1	2	3	4	5	3. Did the speaker speak in a clear, distinct tone?
0	1	2	3	4	5	4. Was the speech interesting?
0	1	2	3	4	5	5. Were all visuals large enough to be seen?
0	1	2	3	4	5	6. Did the speaker make a good impression?

Describe their speech. _____

_____

_____

_____

_____

Discuss your evaluation with the class and instructor.

ASSIGNMENT SHEET #5

Prepared Speech Rating Sheet

Entrant's I.D. / Judging Criteria									
Topic Organization .....40 pts max. (Clear and orderly, etc.)									
Developing introduction . . .20 pts max. (Interest and appeal, etc.)									
Topic Discussion.....10 pts max. (Factual support, etc.)									
Conclusion.....10 pts max. (Summary and appeal, etc.)									
Poise.....10 pts. max. (Confident, body control, posture, etc.)									
Language .....10 pts. max. (Correct grammar, clarity, etc.)									
Sub Total . . .100 pts. max									
Deductions — 1 point for each 10 second interval over 5 min. or under 3 min. No bibliography — deduct 10.									
Total									

VERBAL COMMUNICATION
UNIT II

NAME _____ SCORE _____

TEST

1. Match the terms on the right with the correct definitions.

_____a.	The gestures, mannerisms, and physical appearance of an individual which communicates information and attitudes to the listener	1. Enunciation
_____b.	Hearing and interpreting sounds	2. Jargon
_____c.	Personal subjective responses to a person or situation	3. Pronunciation
_____d.	The process by which information is exchanged	4. Inflection
_____e.	The use of the voice to alter the meaning of a spoken message	5. Listening
_____f.	Special terms or phrases used to describe something in a particular field	6. Skimming
_____g.	Reading through something very quickly, picking out the key points	7. Feedback
_____h.	Refers to the way a word is said	8. Previewing
_____i.	The return of information to the source after an action or process, primarily to evaluate or correct the source	9. Process
_____j.	A series of actions or operations	10. Hearing
_____k.	The physical process of receiving sounds	11. Résumé
_____l.	Reading only part of a report that outlines or summarizes the content	12. Communication
_____m.	The process of speaking each syllable clearly and separately	13. Body language
_____n.	A short account of one's career and qualifications	14. Feelings

TEST

2. Distinguish between the types of communication by writing the correct abbreviation before the word.

   V — Verbal
   NV — Nonverbal

   _____a. Communication sent in ways other than by words

   _____b. Communication using words (spoken or written)

   _____c. Depends on the ability to speak and hear or to read and write

   _____d. Depends on the five basic senses

3. Match types of presentations on the right with the correct descriptions.

   _____a. Presentation illustrating the step-by-step procedure for performing a task or assignment

   _____b. Presentation using objects and visual aids to assist in making a point

   _____c. Formal verbal presentation following a logical sequence

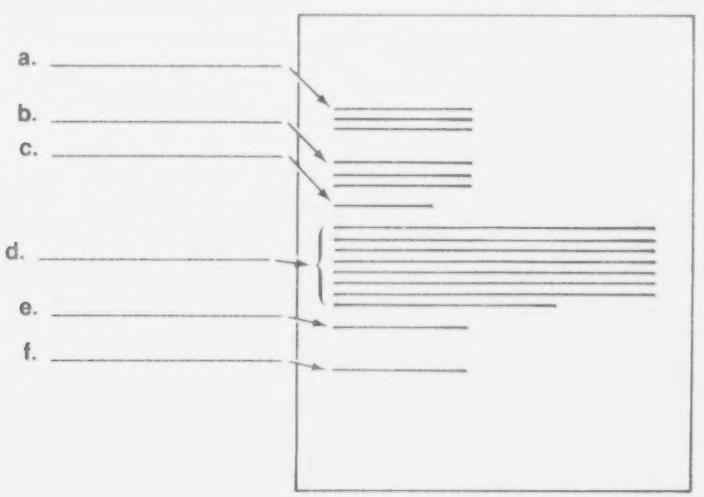
   _____d. Presentation in which three or more individuals discuss a topic from different points of view

   _____e. Speech delivered on an assigned topic with a minimum of advance preparation

   1. Demonstration
   2. Extemporaneous speech
   3. Illustrated talk
   4. Panel discussion
   5. Prepared speech

4. Identify parts of a business letter by supplying the correct names in the space provided.

   Signature, body, heading, greeting, inside address, outside address, and closing



TEST

5. Distinguish between positive and negative body language signals by placing the correct abbreviation before each phrase.

   Positive = P
   Negative = N

   _____a. Eye contact

   _____b. Sitting slightly forward in chair

   _____c. Moving around in chair

   _____d. Arms folded tightly high on chest

   _____e. Scowl or frown

   _____f. Turning head from side to side (disagreement)

   _____g. Smiling

   _____h. Head nodding up and down (agreement)

6. Select true statements concerning factors necessary for effective oral communication by placing an "X" next to the true statements and an "O" by the false statements.

   _____a. Your message does not need to be relevant to the listener.

   _____b. Listening is an art.

   _____c. It's all right to interrupt a speaker.

   _____d. Don't get so involved in thinking about your response that you miss or confuse a point.

   _____e. Listen closely to a speaker and look for nonverbal communication signals.

   _____f. Use language no one else can understand.

   _____g. Be sincere.

   _____h. A location often lends a particular atmosphere to communication.

   _____i. The location should be away from noise and unnecessary interruption.

   _____j. Pretend to listen if the speaker is boring.

TEST

7. Select from the list below ways to make a good first impression when giving a presentation by placing an "X" by the correct statements.

   _____a. Be lazy looking.

   _____b. Be enthusiastic and confident.

   _____c. Be neatly dressed and groomed.

   _____d. Let all important actions and aids be seen clearly.

   _____e. It is not normal to be nervous.

   _____f. Speak clearly and in a pleasant voice.

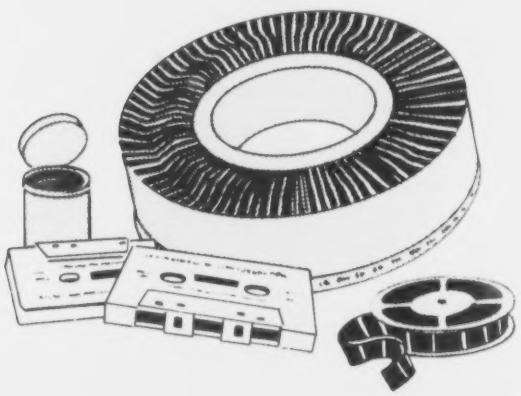
8. Arrange in order the parts of an outline by writing the correct number (1-3) before each word.

   _____a. Body

   _____b. Conclusion

   _____c. Introduction

9. Identify types of visual aids by supplying the correct words below each figure.

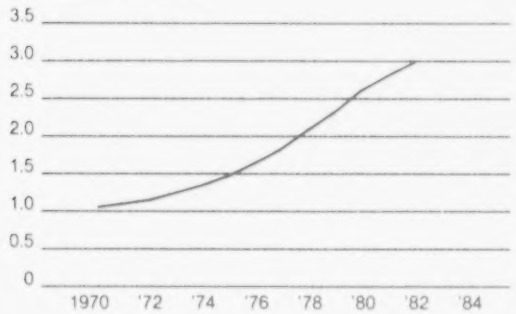


a. _____ b. _____

TEST

Gross National Product (GNP) 1970 to 1982

Trillions of dollars



Source: U.S. Bureau of the Census

c. _____

(NOTE: If the following activities have not been accomplished prior to the test, ask your instructor when they should be completed.)

10. Write business letters. (Assignment Sheet #1)

11. Report observations of a day at school. (Assignment Sheet #2)

12. Prepare an outline for a three-minute speech. (Assignment Sheet #3)

13. Give a three-minute speech. (Assignment Sheet #4)

14. Evaluate a speech. (Assignment Sheet #5)

VERBAL COMMUNICATION
UNIT II

ANSWERS TO TEST

1.
a.	13	f.	2	k.	10
b.	5	g.	6	l.	8
c.	14	h.	3	m.	1
d.	12	i.	7	n.	11
e.	4	j.	9		

2.
a.	NV
b.	V
c.	V
d.	NV

3.
a.	1
b.	3
c.	5
d.	4
e.	2

4.
a.	Heading
b.	Inside address
c.	Greeting
d.	Body
e.	Closing
f.	Signature

5.
a.	P	e.	N
b.	P	f.	N
c.	N	g.	P
d.	N	h.	P

6.
a.	O	f.	O
b.	X	g.	X
c.	O	h.	X
d.	X	i.	X
e.	X	j.	O

7.
a.	O	d.	X
b.	X	e.	O
c.	X	f.	X

8.
a.	2
b.	3
c.	1

9.
a.	Films, tapes, and slides
b.	Models and actual objects
c.	Charts and graphs

10.-14. To be evaluated to the satisfaction of the instructor

DESIGN AND SKETCHING
UNIT III

UNIT OBJECTIVE

After completion of this unit, the student should be able to use the design process to plan, design, and redesign a product. Competencies will be demonstrated by completing the assignment sheets and the unit test with a minimum of 85 percent.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Match terms related to design and sketching with the correct definitions.
2. Arrange in order the steps in the design process.
3. Complete statements concerning the elements of design.
4. Identify examples of the principles of design.
5. Complete statements concerning types of sketches.
6. Select true statements concerning correct freehand sketching techniques.
7. Sketch circles and ellipses.
8. Arrange in order the basic steps for making a sketch.
9. Make a simple sketch. (Assignment Sheet #1)
10. Complete a grid drawing. (Assignment Sheet #2)
11. Design a product. (Assignment Sheet #3)
12. Use a CAD system to design a product. (Assignment Sheet #4)
13. Redesign a product. (Assignment Sheet #5)

DESIGN AND SKETCHING
UNIT III

SUGGESTED ACTIVITIES

A. Obtain additional materials and/or invite resource people to class to supplement/reinforce information provided in this unit of instruction.

(NOTE: This activity should be completed prior to the teaching of this unit.)

B. Provide students with objective sheet.

C. Discuss unit and specific objectives.

D. Provide students with information and assignment sheets.

E. Discuss information and assignment sheets.

F. Integrate the following activities throughout the teaching of this unit:

1. Consult national AIASA competitive events guidelines for communication events and encourage students to participate.

2. Use the grid method for freehand and redesign problems. Refer to *Lines and Views*, Nelson L. Parke, 805 S. Devonshire, Springfield, MO 65802.

3. Use the overlay tracing method to refine designs.

4. Discuss the mechanics of using the computer and peripherals. Use tutorial tapes for instructing the students in computer use.

5. Discuss other methods of sketching.

   Example: Pencil and string for sketching circles, thumbnail sketches

6. Meet individually with students to evaluate their progress through this unit of instruction, and indicate to them possible areas for improvement.

G. Administer test.

H. Evaluate test.

I. Reteach if necessary.

REFERENCES USED IN DEVELOPING THIS UNIT

A. Jones, Ronald E. and Janet L. Robb. *Discovering Technology Communication*. Dallas, TX: Harcourt Brace Jovanovich Publishers, 1986.

REFERENCES USED IN DEVELOPING THIS UNIT

B. Heiner, Carl W. and Wayne R. Hendrix. *People Create Technology.* Worcester, MA: Davis Publications, Inc., 1980.

C. Scott, Raymond C., et al., *Drafting Fundamentals.* Peoria, IL: Bennett & McKnight Publishing Co., 1985.

SUGGESTED SUPPLEMENTAL RESOURCES

A. Walker, John R. *Exploring Drafting.* South Holland, IL: The Goodheart-Willcox Co., Inc., 1982.

B. Hanks, Kurt, Larry Belliston, and Dave Edwards. *Design Yourself!* Los Altos, CA 94022: William Kaufman, Inc., 1978.

Available from
Creative Learning Systems
9889 Hibert, Suite E
San Diego, CA 92131
(619) 566-2880

DESIGN AND SKETCHING
UNIT III

INFORMATION SHEET

I. **Terms and definitions**

A. Design — A plan or sketch to be used as a guide in making something; the creative process for finding solutions to problems

B. Freehand sketch — A drawing made without the use of special tools

(NOTE: Almost all design ideas have their beginning in freehand sketches.)

C. Balance — A design principle that deals with the apparent weight of the right and left side of a graphic design

D. Proportion — The size relationship between elements in a design

E. Instrument drawings — Precise, accurate drawings made with the use of drafting equipment

F. Computer-aided drafting (CAD) and computer-aided drafting and design (CADD) — Processes that use a computer to create or modify a design

G. Drafting — The representation of a "real" object on a two dimensional surface using applied rules

H. Graphics communication — Communicating a message or idea with illustrations and words

I. Drafter — Person who does drafting and design problems

II. **Steps in the design process**

A. State the objective (problem) — Decide what is to be designed or transmitted and state the problem as clearly and specifically as possible.

(NOTE: Answer the who, what, where, when, and how questions at this time.)

B. Gather information — Research the problem by reading, discussing, and thinking about it.

C. Find solutions — Think of all the bits of information you have gathered and decide the best way to solve the problem.

D. Evaluate solutions — Decide on the best possible solution; then reexamine the solution possibilities.

(NOTE: Decide if it is a cost-effective solution.)

E. Refine ideas and present solution — Prepare sketches or script for message.

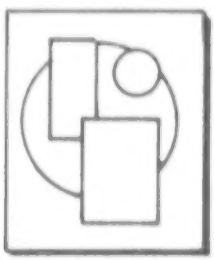
INFORMATION SHEET

III. Elements of design

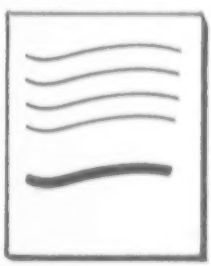
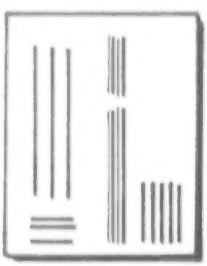
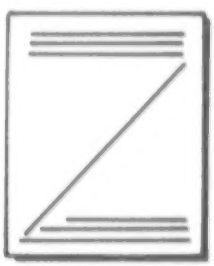
A. Space — The area allowed to work with

Examples: Piece of paper, billboard, package label

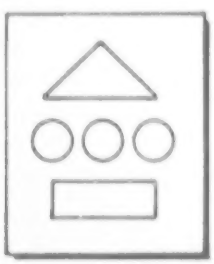
(NOTE: Space for audiovisual design could be a commercial, television program, or a play.)



B. Line — Moves the reader's eye from one point to another; may be straight, curved, angled, heavy, or light

C. Form — Gives the element shape; may be a square, rectangle, circle, triangle, or irregular shape



D. Color — Attracts the eye and provides contrast as well as sets the mood of a design

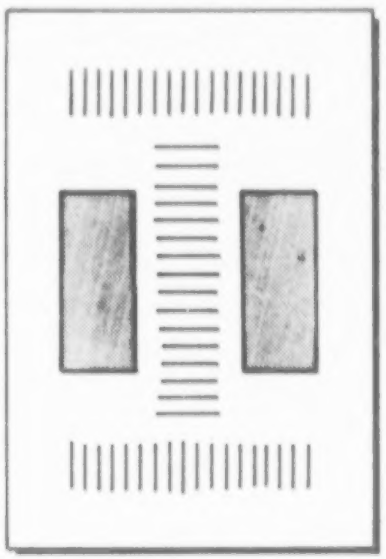
(NOTE: Red, yellow, and orange are warm colors. These colors seem to jump out from the page. Blue, green, and purple are cool colors. These colors seem to recede into the page. Dark colors make objects appear smaller. Light colors make objects appear lighter.)

INFORMATION SHEET

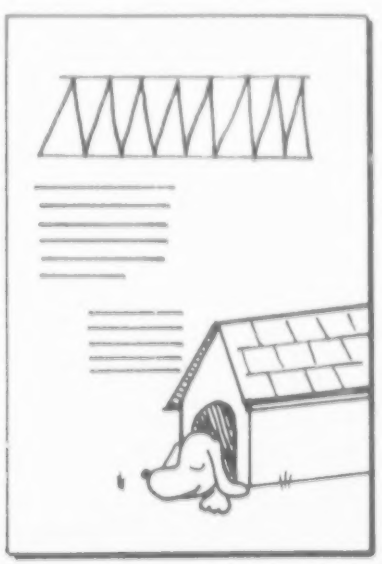
IV. Principles of visual design

A. Balance — Distribution of weight on each side of a center point; may be formal or informal. (Transparency 1)

1. Formal balance — Symmetrical; achieved by identical or even placement on each side of the center point

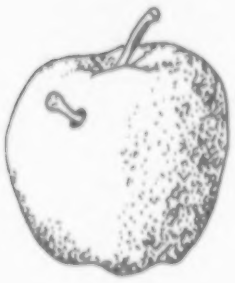


2. Informal balance — Asymmetrical; achieved by equalizing the weight of different elements in a design. A smaller element placed farther away from the central point can balance a larger element which is closer to the center.



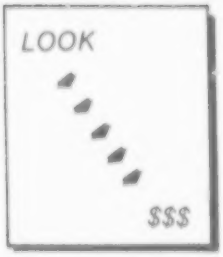
INFORMATION SHEET

B. Proportion — Relationship between the sizes of the elements of the design



C. Rhythm — Directs and controls the motion of the reader's eye.

Example:



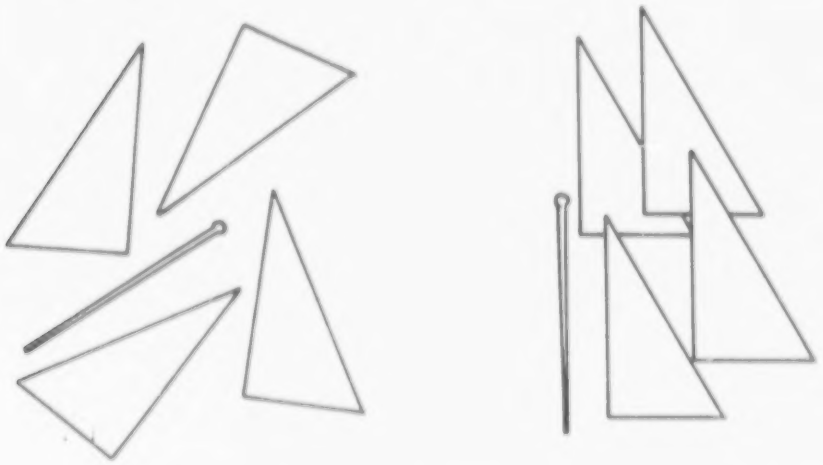
D. Contrast or emphasis — Used to create interest and attract attention by using differences in size, color, or appearance.

Examples:

INFORMATION SHEET

E. Unity — A combination of different elements to promote an undivided total effect. Similar forms or typefaces are commonly used in a design to promote unity.

Example:



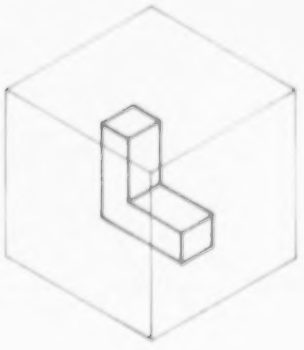
(NOTE: The pile of elements on the left have been arranged randomly, but if they are placed as shown on the right, they seem to belong together.)

V. Types of sketches

(NOTE: Engineers use sketches to present their ideas to drafters who can then prepare finished technical drawings.)

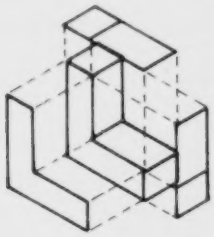
A. Orthographic (multiview) sketches

1. In order to select the view needed to illustrate an object, imagine an object inside a glass box.

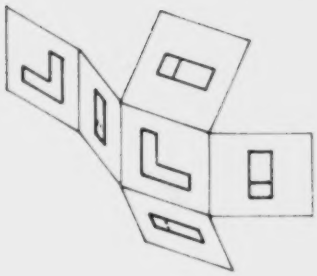


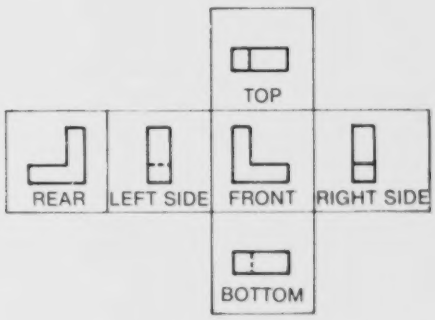
INFORMATION SHEET

2. Project the surfaces of the object onto the sides of the box.



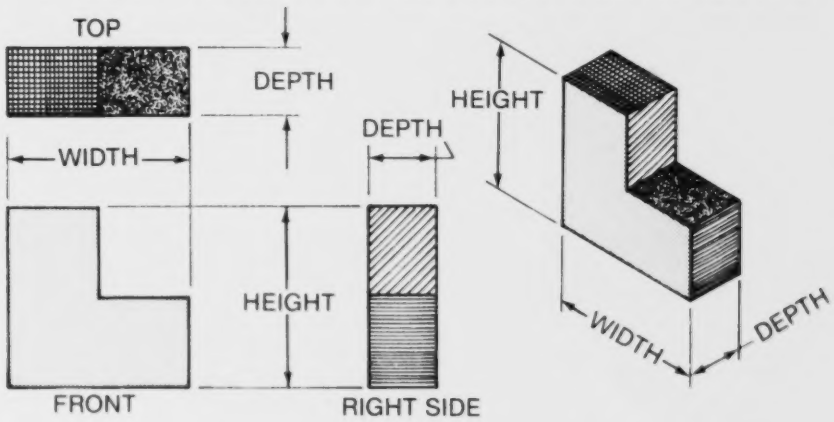
3. Unfold the glass box and lay it flat. You can now see all six sides.





(NOTE: Although six sides are possible, only three are commonly used in multiview drawing.)

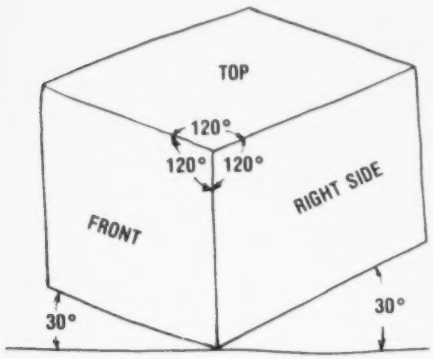
4. Choose the principal views that show the width, height, and depth of the object. These views will usually be the front, top, and right side.



INFORMATION SHEET

B. Pictorial (isometric) sketches

1. Show the shape of an object as viewed by the eye.
2. All lines which show the width and depth are drawn full length.
3. Edges which are upright are shown by vertical lines.



VI. Freehand sketching techniques

A. Grid paper, especially paper with noncopying blue lines, is very useful when sketching to keep lines in proportion.

B. A hard pencil (5H-6H) producing light lines is ideal for sketching. A soft pencil (HB-2H) will be used later to darken in permanent object lines. Erasing the light lines is usually not necessary.

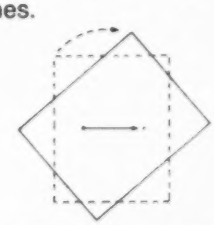
C. Pencils should be properly sharpened for sharp lines.

D. The pencil should be held lightly so it is comfortable.

E. Horizontal lines are drawn from left to right for right handers, right to left for left handers. Pulling the pencil in this way produces a smoother line.

F. Vertical lines are drawn from top to bottom.

G. When drawing diagonal lines, it is helpful to turn the paper so that you are making horizontal lines.



H. Always direct your eye to where you are going, rather than where you have been. This will help keep your lines straighter.

INFORMATION SHEET

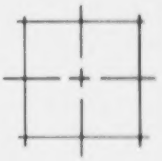
VII. Sketching circles and ellipses

(NOTE: There are several methods for sketching circles and ellipses in addition to the one shown.)

A. Sketching circles

1. Sketch in center lines.

2. Box in circle at diameter required.



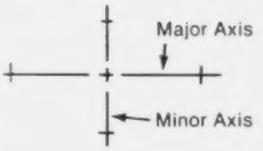
3. Put in diagonal lines and mark radius points from center.

4. Rotate wrist in a circular motion and connect arcs.

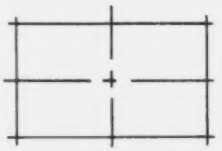
5. Erase construction lines and darken outline.

B. Sketching ellipses

1. Mark off major and minor axes on center lines.



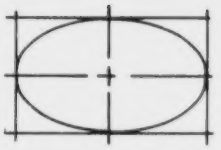
2. Box in outlines of the ellipse.



3. Sketch in major and minor arcs of the ellipse.

INFORMATION SHEET

4. Rotate wrist in a curving motion and connect arcs.



5. Erase construction lines and darken outline.

VIII. Basic steps for making a sketch

A. Draw light guidelines to show the shape of the object.

B. Lightly draw in the outline of the object.

C. Lightly draw in the inside details.

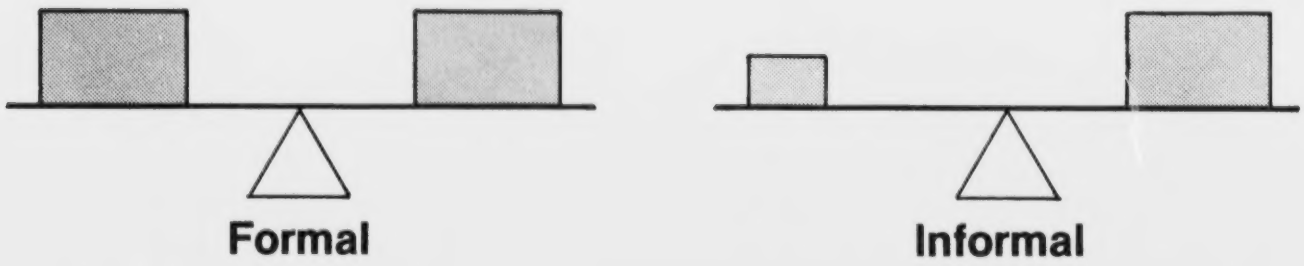
INFORMATION SHEET

D. Darken in the outline and inside details.

E. Erase any distracting outlines.

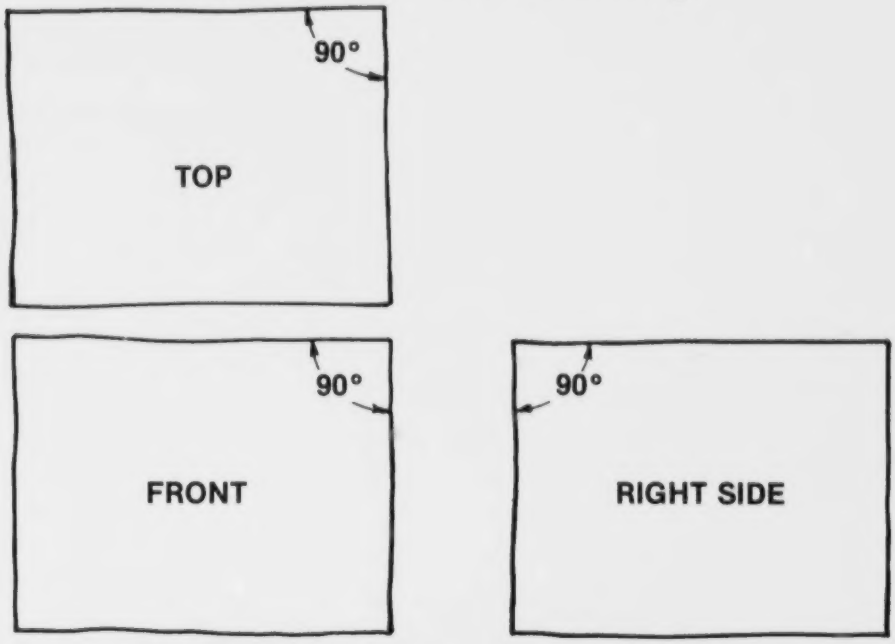
(NOTE: Even though the steps listed above look easy, do not skip any. Take time to complete each one. The results will be worth the effort.)

Balance

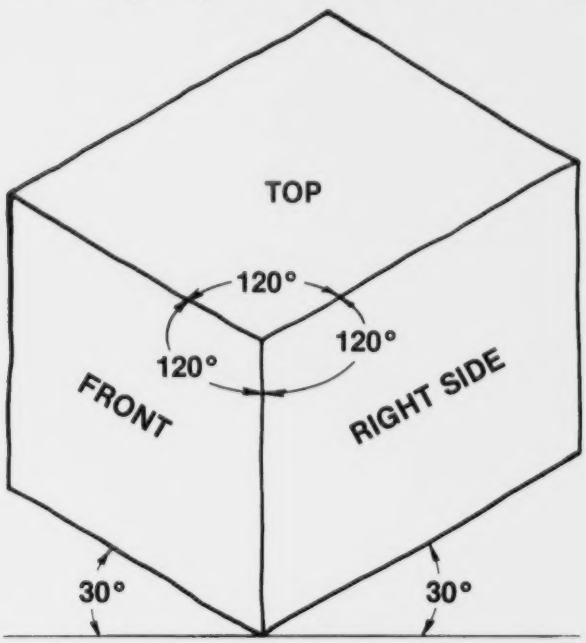


The distribution of weight on each side of a center point

Types of Sketching



Orthographic Sketching



Pictorial Sketching

DESIGN AND SKETCHING
UNIT III

ASSIGNMENT SHEET #1 — MAKE A SKETCH OF A SIMPLE OBJECT

NAME _____ SCORE _____

Directions: Use a pad of plain paper, a soft (2H) pencil, and a hard (4 or 6H) pencil to make a simple sketch. Use one of the objects listed or use your own ideas.

Examples: Paper weight, pencil holder, table, trash can, flower pot, dragster

DESIGN AND SKETCHING
UNIT III

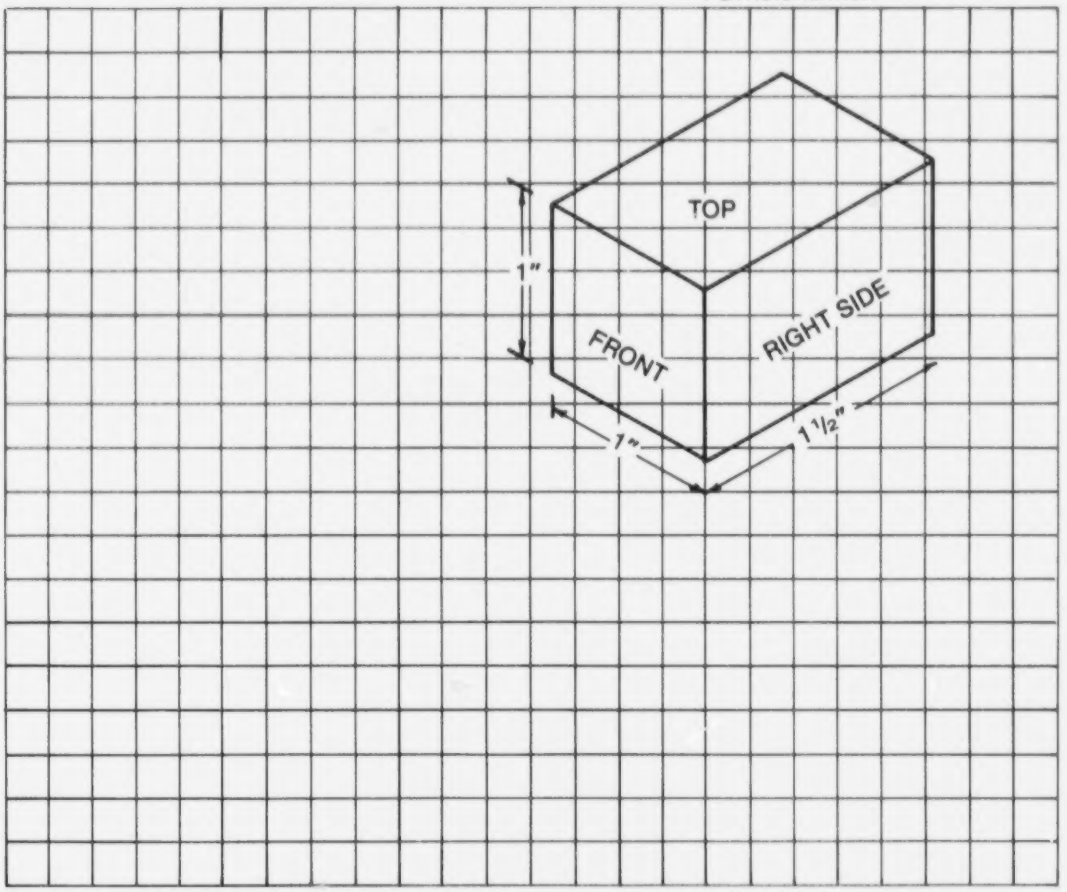
ASSIGNMENT SHEET #2 — COMPLETE A GRID DRAWING

NAME _____ SCORE _____

Directions: Use the grid below and complete a three view drawing of the object shown. Label the views of your drawing. Your instructor will evaluate your drawing in the following areas:

1. Views were placed and spaced correctly.
2. Each view was the proper size.
3. The drawing was neat and legible.

4 Divisions/Inch



DESIGN AND SKETCHING
UNIT III

ASSIGNMENT SHEET #3 — DESIGN A PRODUCT

NAME _____ SCORE _____

Directions: Select a design problem and produce at least three sketches to illustrate your solution to the problems.

(NOTE: Use plain, unlined paper and hard and soft lead pencils for this assignment.)

Examples of design problems:

- A catapult that will launch a marshmallow over a one foot wall
- A two foot long truss that will hold 40 pounds of weight
- A container that will protect an egg when dropped from a height of five-ten feet
- A dragster that has good aerodynamic design

Your instructor will evaluate your design in the following areas:

1. Clarity of design
2. Ability to logically solve a problem
3. Creativity

DESIGN AND SKETCHING
UNIT III

ASSIGNMENT SHEET #4 — USE A CAD SYSTEM TO DESIGN A PRODUCT

NAME _____ SCORE _____

Directions: Use the computer as a design tool. Select appropriate software program and

1. Choose design problem
2. Gather necessary information
3. Decide on solution
4. Make a simple sketch

(NOTE: Consult user's manual and instructor for instructions.)

DESIGN AND SKETCHING
UNIT III

ASSIGNMENT SHEET #5 — REDESIGN A PRODUCT

NAME _____ SCORE _____

Directions: Choose one of the following options. Use the steps stated in Information Sheet, Section II and redesign a sketch to the final step.

OPTIONS:

A. Use your best sketch from Assignment Sheet #1.

B. Use instructor's sketch.

C. Use the CAD system to redesign your drawing in Assignment Sheet #4.

This assignment will be evaluated in the following areas:

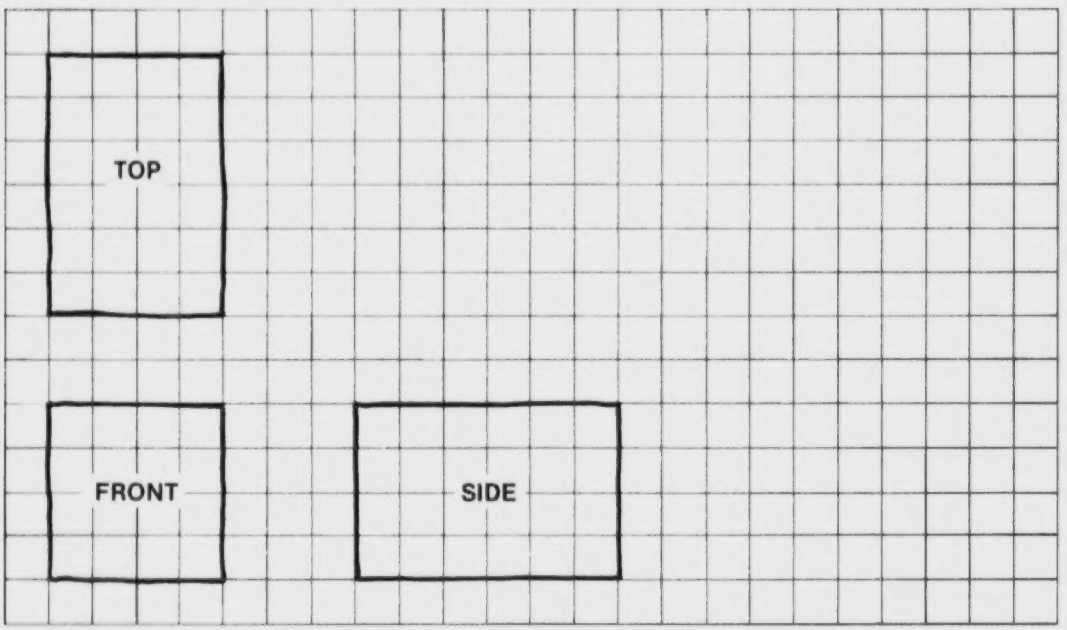
1. The design was improved.
2. The product will now be more useful or valuable.

DESIGN AND SKETCHING
UNIT III

ANSWERS TO ASSIGNMENT SHEETS

Assignment Sheet 1 — This is to be a simple freehand sketch that can be used to evaluate the students beginning ability to sketch.

Assignment Sheet #2



Assignment Sheet #3-5 — Evaluated to the satisfaction of the instructor

DESIGN AND SKETCHING
UNIT III

NAME _____ SCORE _____

TEST

1. Match the terms on the right with their correct definitions.

_____a.	A design made without the use of tools	1. Proportion
_____b.	Precise, accurate drawings made with the use of drafting equipment	2. Computer-aided drafting (CAD) or computer-aided design and drafting (CADD)
_____c.	Representation of a "real" object on a two dimensional surface using applied rules	3. Drafting
_____d.	A person who does drafting and design problems	4. Graphic communication
_____e.	The size relationship between elements in a design	5. Drafter
_____f.	A plan or sketch to be used as a guide in making something	6. Instrument drawing
_____g.	A process that uses a computer to create or modify a design	7. Design
_____h.	Communicating a message or idea with illustrations and words	8. Freehand sketch
		9. Balance

2. Arrange in order the steps in the design process by writing the correct number (1-5) by each step.

_____a. Evaluate solutions.

_____b. State the objective.

_____c. Refine ideas and present solution.

_____d. Gather information.

_____e. Find solution.

3. Complete the following statements concerning the elements of design by circling the correct word or words in the blanks.

a. The element of design that attracts the eye and provides contrast is (**line, color**).

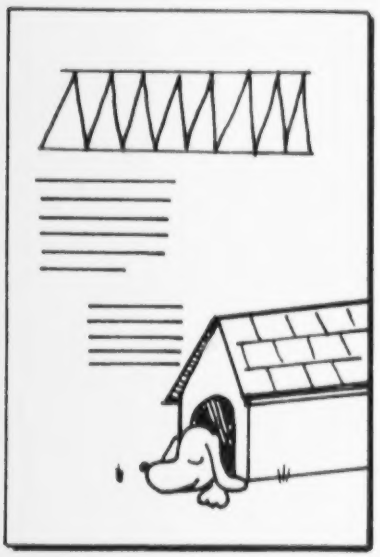
b. (**Form, Balance**) gives an element shape.

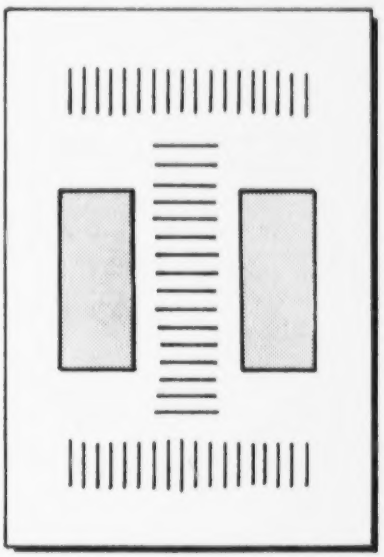
TEST

c. The area allowed to work with is called (**space, rhythm**).

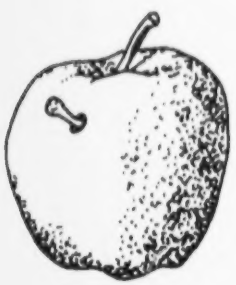
d. The element of design that moves the reader's eye from one point to another is (**unity, line**).

4. Identify the following examples of the principles of design with one of the following terms: formal balance, informal balance, proportion, rhythm, contrast, unity, weight.



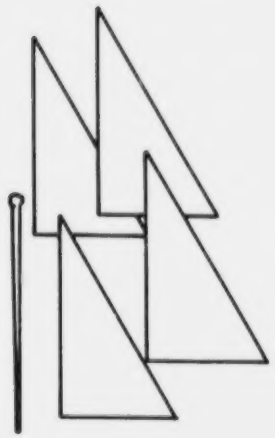


a. _____ b. _____



c. _____ d. _____

TEST



e. _____

5. Complete the following statements concerning types of sketches by circling the correct words.

   a. The principal views in an orthographic sketch usually show the width, height, and (**depth, length**) of an object.

   b. The principal views in an orthographic sketch will usually be the front, (**top, bottom**) and right side views.

   c. The type of sketch that shows the shape of an object as viewed by the eye is (**orthographic, pictorial**).

   d. In a pictorial sketch, all lines which show the width and depth are drawn (**half, full**) length.

6. Select true statements concerning correct freehand sketching techniques by placing an "X" by the true statments and an "O" by the false statements.

   _____a. Grid paper is very useful when sketching.

   _____b. A hard pencil should be used to darken in permanent object lines.

   _____c. Dull pencils are best for sketching.

   _____d. The pencil should be held tightly so it won't slip.

   _____e. Right handers should draw horizontal lines from right to left.

   _____f. Vertical lines should be drawn from top to bottom.

TEST

7. Sketch a 1" diameter circle and an ellipse with a 1 ½" major axis and a 1" minor axis in the space below. Do **not** erase your light construction lines.

8. Arrange in order the basic steps for making a sketch by writing the correct number (1-5) by each step.

   _____a. Darken the outline and inside details.

   _____b. Erase all distracting lines.

   _____c. Draw light guidelines to show the shape of the object.

   _____d. Lightly draw the inside details.

   _____e. Lightly draw in the outline of the object.

(NOTE: If the following activities have not been accomplished prior to the test, ask your instructor when they should be completed.)

9. Make a simple sketch. (Assignment Sheet #1)

10. Complete a grid drawing. (Assignment Sheet #2)

11. Design a product. (Assignment Sheet #3)

12. Use a CAD system to design a product. (Assignment Sheet #4)

13. Redesign a product. (Assignment Sheet #5)

DESIGN AND SKETCHING
UNIT III

ANSWERS TO TEST

1. a. 8 e. 1
   b. 6 f. 7
   c. 3 g. 2
   d. 5 h. 4

2. a. 4
   b. 1
   c. 5
   d. 2
   e. 3

3. a. Color
   b. Form
   c. Space
   d. Line

4. a. Informal balance
   b. Formal balance
   c. Proportion
   d. Rhythm
   e. Unity

5. a. Depth
   b. Top
   c. Pictorial
   d. Full

6. a, f

7. Evaluated to the satisfaction of the instructor

8. a. 4
   b. 5
   c. 1
   d. 3
   e. 2

9.-13. Evaluated to the satisfaction of the instructor

DRAFTING
UNIT IV

UNIT OBJECTIVE

After completion of this unit, the student should be able to identify drafting tools and equipment and complete orthographic projections and isometric drawings. Competencies will be demonstrated by completing the assignment sheets and the unit test with a minimum of 85 percent.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Match terms related to drafting with the correct definitions.
2. Identify manual drafting tools and equipment.
3. Identify manual drafting aids.
4. Match types of drafting media with the correct descriptions.
5. State standard and alternate sizes for drafting sheets.
6. Select true statements concerning good drafting habits.
7. Identify types of machine drafting equipment.
8. Identify computer-aided drafting (CAD) equipment.
9. Match CAD terminology with the correct definitions.
10. Identify lines used in drafting.

OBJECTIVE SHEET

11. Distinguish between the two basic systems of linear measurement.
12. Select factors that make a good drawing.
13. Identify principal views used in orthographic projection.
14. Match types of pictorial drawings with the correct illustrations.
15. Sketch missing views. (Assignment Sheet #1)
16. Produce orthographic projections. (Assignment Sheet #2)
17. Produce isometric drawings. (Assignment Sheet #3)
18. Produce and print a drawing using CAD. (Assignment Sheet #4)

DRAFTING
UNIT IV

SUGGESTED ACTIVITIES

A. Obtain additional materials and/or invite resource people to class to supplement/reinforce information provided in this unit of instruction.

(NOTE: This activity should be completed prior to the teaching of this unit.)

B. Make transparencies from the transparency masters included with this unit.

C. Provide students with objective sheet.

D. Discuss unit and specific objectives.

E. Provide students with information and assignment sheets.

F. Discuss information and assignment sheets.

G. Integrate the following activities throughout the teaching of this unit:

1. Collect objects to be drawn in class, ones that require two and three views to illustrate.

2. Construct a hinged clear plastic box. Use to demonstrate the unfolding of an object into its multiview parts. Place an object inside and trace the profile of the views on the side of the plastic box with chalk or grease pencil. Then unfold the box.

3. Demonstrate and implement CAD in the drafting unit.

4. Assign perspective drawing assignments if time allows.

5. Plan to integrate desktop publishing. Software for this program is available from local computer stores or computer magazines.

6. Utilize the precision drawing system throughout drafting and design problems. The system is available from:

   Intermark Enterprises
   610 West Broadway
   Suite 213
   Tempe, Arizona 85282

7. Meet individually with students to evaluate their progress through this unit of instruction, and indicate to them possible areas for improvement.

H. Administer test.

I. Evaluate test.

J. Reteach if necessary.

REFERENCES USED IN DEVELOPING THIS UNIT

A. Fuller, James E. *Using Autocad.* Albany, NY: Delmar Publishing Co, 1986.

B. Spence, William P. *Drafting.* Peoria, IL: Chas. A. Bennett Co., 1973.

C. Jones, Ronald E. and Janet L. Robb. *Communication.* Dallas, TX: Harcourt Brace Jovanovich Publishers, 1986.

D. Scott, Raymond C., et. al. *Drafting Fundamentals.* Peoria, IL: Bennett & McKnight Publishing Co., 1985.

E. Walker, John R. *Exploring Drafting.* South Holland, IL: The Goodheart-Willcox Co., Inc., 1982.

F. Merickel, Mark. *Stepping into CAD.* Thousand Oaks, CA: New Riders Publishing, 1986.

SUGGESTED SUPPLEMENTAL RESOURCES

Computer Software Programs

A. *Print Shop* — Simple to use. Writes, designs, and prints business cards, letterheads, notices, etc. Teaches layout technique. Has different type styles, borders, and clip art. Available for IBM, Apple II, Macintosh, and Apple family hardware.

B. *Newsroom* — Designs, produces, and prints newspapers. Has a large clip art library. Available for Apple II, Apple family, and IBM hardware.

C. *Computer Eyes II* — Creates real world images by hooking a video camera to a computer and digitizes the picture onto paper. Available for Apple II and IBM hardware.

The above software as well as many others are available from your local computer center, computer magazines, or the following:

Pitsco
Box 1328
Pittsburg, KS 66762
1 800 835-0686

D. MACVision — Video digitizing device which uses a radio signal and converts it to digits so the microcomputer can use or store it. The image can then be printed. Ideal for a type of screen printing. This is available from local software stores.

VHS or Beta Videotape

Drafting, CS-153, Discusses the men and women who are occupied with preparing detailed drawings to specified dimensions. Typical areas of specialization include architectural, engineering, commercial and topographical drafting. Management views on skills and amenities are introduced and training programs reviewed. Available from:

Morris Video
413 Avenue G #1
P.O. Box 443
Redondo Beach, CA 90277
1 800 843-3606

DRAFTING
UNIT IV

INFORMATION SHEET

I. **Terms and definitions**

A. Acetate — A clear plastic film which has no drafting surface

B. American National Standards Institute (ANSI) — Coordinates the development of many kinds of standards, including the currently accepted drafting standards

C. Diazo process — A copying technique for making direct positive copies

D. Gloss — A surface that has a bright, polished finish

E. Matte — A slightly rough finish free from shine or highlights

F. Medium (pl. Media) — Material used to carry information; in drafting, includes various papers and films used for written and drafted information

G. Mylar — Brand name of a polyester film used as a base for drawing in the drafting industry

H. Plane of projection — A plane on which the points of an object are extended forward resulting in one view of the object

I. Polyester film — A drawing medium that is matte on one or both sides for a drafting surface; accepts both ink and pencil and comes in various mil thicknesses

J. Reproducible — An original drawing on a translucent material suitable for diazo reproduction

K. Station point — Assumed plan view point representing the observer's eye

L. Translucent — Transmitting and diffusing light so that objects beyond cannot be seen clearly

M. Transparent — Transmitting light without appreciable scattering so that objects beyond are clearly visible

N. Vellum — A prepared tracing paper that has the strength and transparency to make a good drawing surface

O. Vanishing point — A point toward which receding lines of sight converge in a perspective drawing

INFORMATION SHEET

II. **Manual drafting tools and equipment** (Transparencies 1 and 2)

A. T-square or parallel bar

B. Triangles

C. Protractor

D. Compass

E. Scales

F. Pencils

(NOTE: These may be wooden or mechanical and come in many degrees of hardness.)

G. Erasers

H. Drafting media

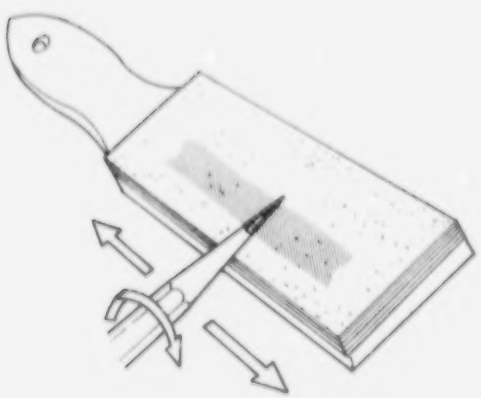
Examples: Drawing paper, vellum, polyester film

III. **Manual drafting aids**

A. Lead pointers — Used for sharpening drafting pencils

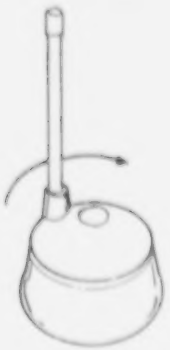
1. Sharpening pad

(NOTE: The top layer of sandpaper peels off when it is completely used.)



INFORMATION SHEET

2. Pointer



B. Drafting tape — Used for securing drafting medium to table top

(NOTE: Drafting tape peels off easily, does not tear paper, does not leave a sticky residue, and can be reused.)

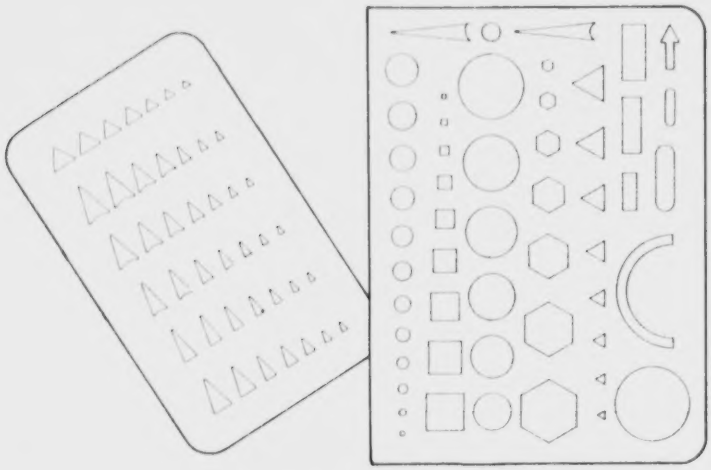
C. Brush — Used for sweeping eraser crumbs, etc. off the drawing surface

D. Irregular (French) curve — Used to draw curved lines that are not drawn with a compass

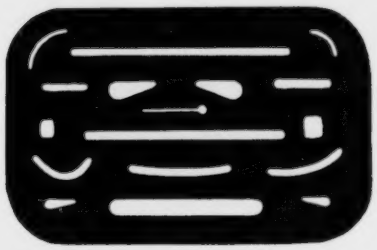
INFORMATION SHEET

E. Templates — Used for drawing common shapes, symbols, and letters

(NOTE: These are time-saving devices. A variety of templates are available for different features on drawings and for different drafting fields.)



F. Erasing shield — Used for erasing small portions of a drawing



IV. Types of drafting media

A. Tracing paper — Thin, untreated, translucent paper used for quick notes or drawings; inexpensive

B. Vellum — Thin, treated, translucent paper used for standard drafting work

C. Polyester drafting film — Usually made by bonding a matte surface to one or both sides of a clear polyester sheet to form a tough, translucent drafting medium; is resistant to moisture, tearing, erasing, and general wear

D. Gridded media — Film or paper printed with black or blue 90° grids with single or double matte surfaces

INFORMATION SHEET

V. Drafting sheet sizes

Letter Designation	Standard Size	Alternate Size
Size A	8½" × 11"	9" × 12"
Size B	11" × 17"	12" × 18"
Size C	17" × 22"	18" × 24"
Size D	22" × 34"	24" × 36"
Size E	34" × 44"	36" × 48"

VI. Good drafting habits

A. Keep your instruments and equipment clean.

B. Keep the leads on your pencils sharp for good line quality.

C. Make sure your hands are clean before you start drafting.

D. Always lift equipment (triangles, templates, T-squares) when moving them across your drafting sheet. Sliding them can smear work underneath.

E. Keep your tabletop uncluttered.

F. Use your drafting brush, not your hand, to dust off your tabletop.

G. Store drawings flat or rolled up. Do not fold drawings. Creases will interfere in blueprinting or reproduction of the original.

H. Always use guidelines for lettering.

I. Use an appropriate straight edge for drawing straight lines; do not use your scale to draw straight lines.

VII. Types of machine drafting equipment (Transparency 3)

A. Arm-type drafting machine

B. Track-type drafting machine

(NOTE: Drafting machines replace T-squares, parallel bars, and triangles. The straight edges can be adjusted to any angle. Industry makes considerable use of this device.)

INFORMATION SHEET

VIII. Computer-aided drafting (CAD) equipment (hardware) (Transparency 4)

(NOTE: CAD is considered a more efficient and versatile drafting method than traditional techniques. Some of its advantages are accuracy, speed, consistency, efficiency, neatness, and legibility. Traditional drafting techniques should be studied before undertaking the CAD process.)

A. Information processing unit (IPU) — Computer chip(s) in the computer

(NOTE: This is also referred to as the computer's central processing unit or CPU.)

B. Input devices

1. Keyboard
2. Digitizer
3. Graphic tablet

C. Memory recording and storage devices

1. Floppy disk drive
2. Hard disk drive

D. Output devices

1. Plotter
2. Printer
3. CRT monitor (for immediate visual output)

(NOTE: There are other types of peripheral devices that may be added to a system for special work, but not all devices are used in every system.)

IX. CAD terminology and definitions

A. Alphanumeric — The letters A-Z, the numerals 0-9, and various punctuation marks and special characters

B. Binary code — Two-digit numbering system composed of only 0 and 1

C. Bit — Binary digit; the smallest unit of information that can be recognized by a computer

(NOTE: This will always be a 0 or 1.)

INFORMATION SHEET

D. Byte — Unit of computer memory, made up of a specified number of bits, which can represent any digit, letter of the alphabet, or special character

E. Computer — An electronic information-handling machine capable of performing arithmetical calculations and making logical decisions under the control of programs

F. Cursor — Flashing rectangular dot or cross hair that indicates the current position on the screen

G. Data — Information of all kinds

H. Digit — Any number from 0 through 9

I. File — Collection of related data treated as a unit

J. Graphics — Computer output that is composed of lines rather than letters, numbers, or symbols

K. Hardware — Any physical equipment that is a part of the CAD system

L. Input — Data sent from a peripheral device to the CPU

M. Interface — The interconnecting methods or devices used in the CAD hardware system

N. K — Symbol denoting 1024 bytes of storage

O. Menu — Graphic symbols or information arranged in software to be retrieved at some later time

P. Output — Data sent from the CPU to a peripheral device

Q. Peripheral devices — Various devices used in a CAD system to input, store, retrieve, and output data to and from the CPU

(NOTE: These devices are external to the CPU.)

R. Program — Step-by-step instructions which cause the computer to solve a problem

S. Routine — A sequence of instructions to carry out a certain function

T. Software — Prepared programs that cause hardware to function

INFORMATION SHEET

X. **Lines used in drafting** (Transparency 5)

A. Border line (very thick)

B. Visible line (thick)

C. Dimension line (thin)

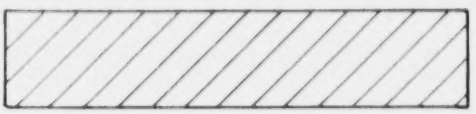
D. Extension line (thin)

E. Hidden line (medium)

F. Center line (thin)

G. Cutting plane line (thick)

H. Section line (thin)



I. Phantom line (thin)

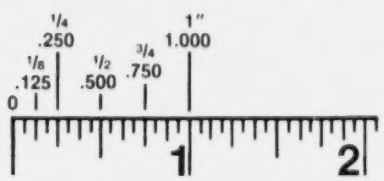
(NOTE: Line widths are determined by the width sizes of pens [00, 0, 1, etc.] or hardness numbers of pencils [H, HB, etc.].)

XI. **Systems of linear measurement**

A. U.S. customary — Primarily used in the U.S. with a basic unit of an inch and its fractional or decimal parts

1. The inch can be divided into common fractional parts such as 3/4, 1/2, 1/4, 1/8, 1/16, or 1/32 inch.

2. Common fraction parts may be expressed as decimal fractions such as 0.1, 0.01, or 0.001 inch.



INFORMATION SHEET

B. Metric system (SI) — The international system of measurement with a basic unit of a meter and its decimal parts

1 meter = 10 decimeters (dm)
1 decimeter = 10 centimeters (cm)
1 centimeter = 10 millimeters (mm)

(NOTE: 1 meter = 39.37 inches. There are charts available to assist in converting millimeters to decimal inches and fractional inches to millimeters. The SI metric system is based on 10. It does not use fractions. When used on a drawing, the dimensions are shown in millimeters and decimal parts of a millimeter.)

XII. Factors that made a good drawing

A. Drawing is well centered.

B. Drawing is neat and clean.

C. Line weight is correct.

D. Lettering is legible and uniform.

E. Corners of drawing are sharp.

F. Drawing is readable and accurate.

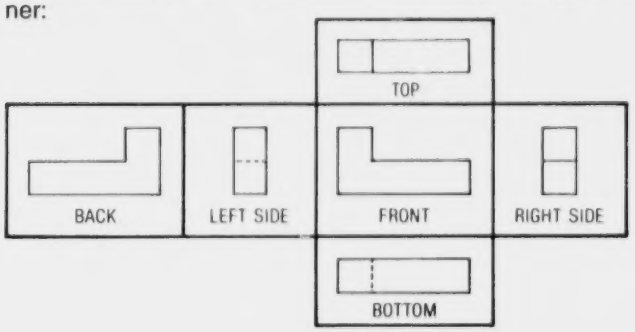
G. Title block is complete.

XIII. Orthographic projection

A. Is also called multiview projection or drawing because it shows many views of an object.

B. As was earlier explained in sketching, when an object is visualized in a glass box, its sides can be projected to the sides of the box, resulting in six views.

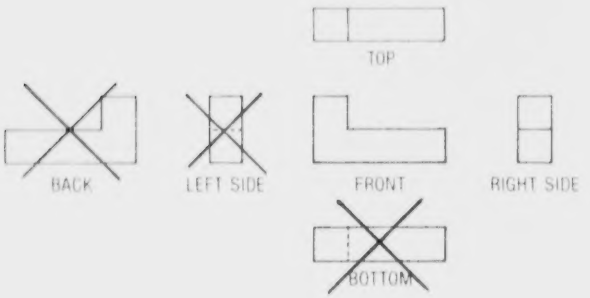
C. The six views of an object are traditionally arranged in the following manner:



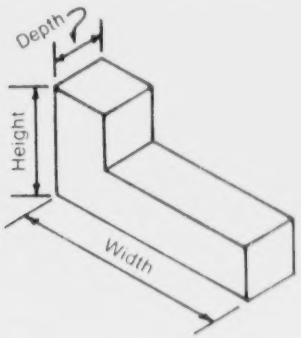
INFORMATION SHEET

D. Usually, the drafter will only draw the views that are *necessary* to adequately describe the object.

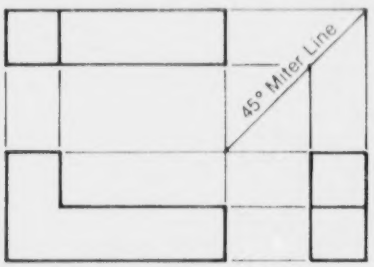
(NOTE: Very complicated objects may require all six views to describe them, but more simple objects may only need two or three views.)



E. The height and width of the object can be shown on the front view, but another view will be needed to show the depth of the object. Depth can be shown in a top, bottom, or side view.



F. The depth dimension can be transferred to other views using a scale, dividers, or a 45° miter line.

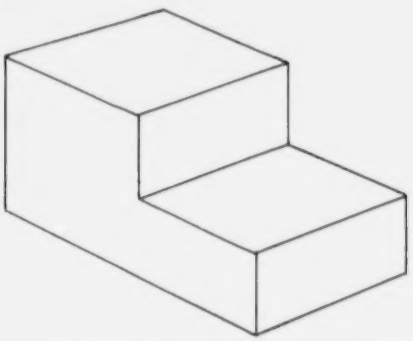


INFORMATION SHEET

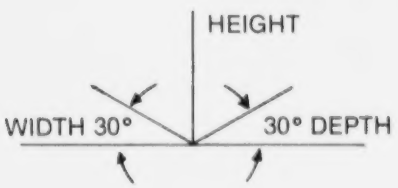
XIV. Types of pictorial drawings

A. Isometric drawing — A pictorial drawing that shows objects as they are being viewed from one edge. Isometric objects appear to be angled and slightly tilted toward the viewer. Usually the top, front, and right side of an object are shown.

(NOTE: Objects can be drawn to show other sides as well.)



There are three axes in an isometric drawing: height, width, and depth. Lines that show the height of the object are drawn vertically. Lines that show the width and depth of the object are drawn at 30-degree angles from the horizontal.

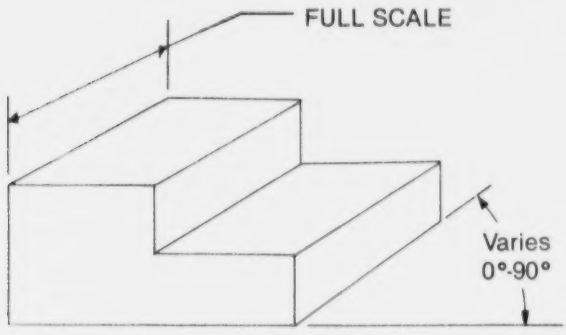


(NOTE: Isometric drawings are made entirely with instruments.)

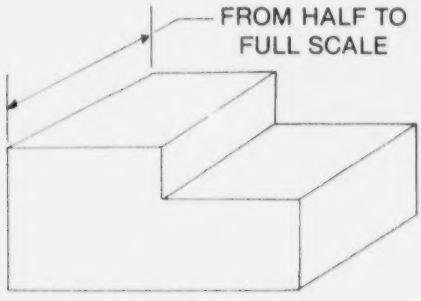
INFORMATION SHEET

B. Oblique drawing — A pictorial drawing similar to an isometric except for one surface, the longest dimension or front, is parallel to the picture plane and is shown in the true shape and size. Different types of oblique drawings use different scales when drawn. Note the following figures.

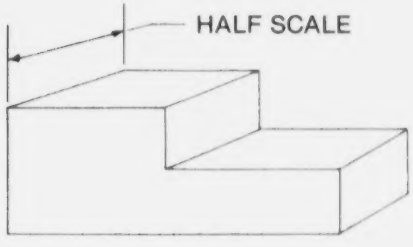
1. Cavalier — The depth axis lines are full scale.



2. General — The depth axis varies from one-half to full scale



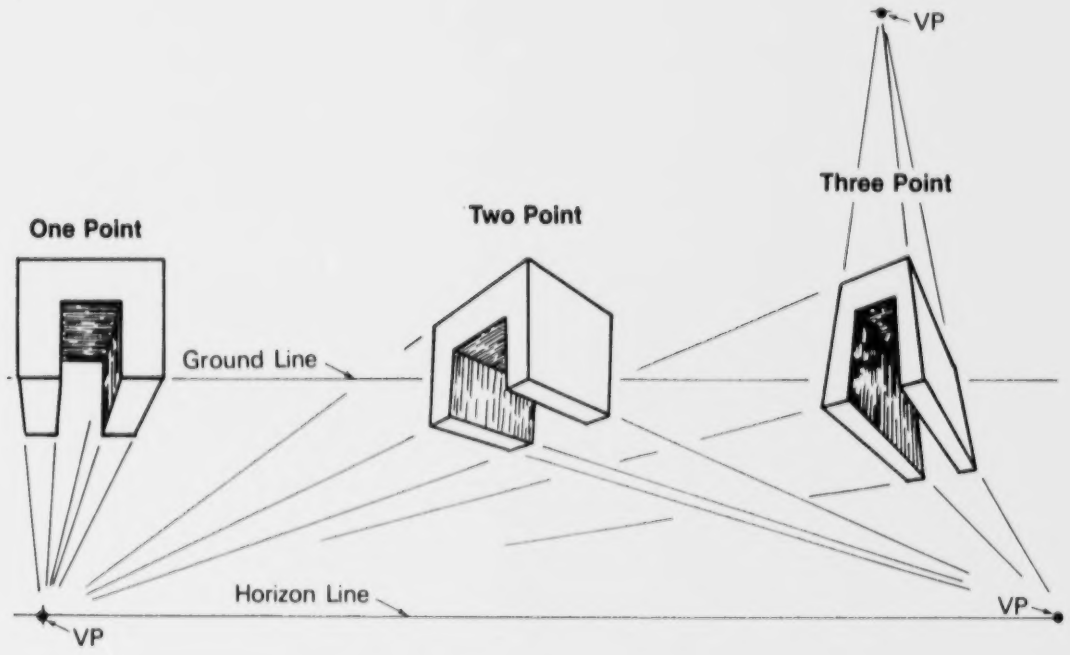
3. Cabinet — The depth axis is drawn half scale.



INFORMATION SHEET

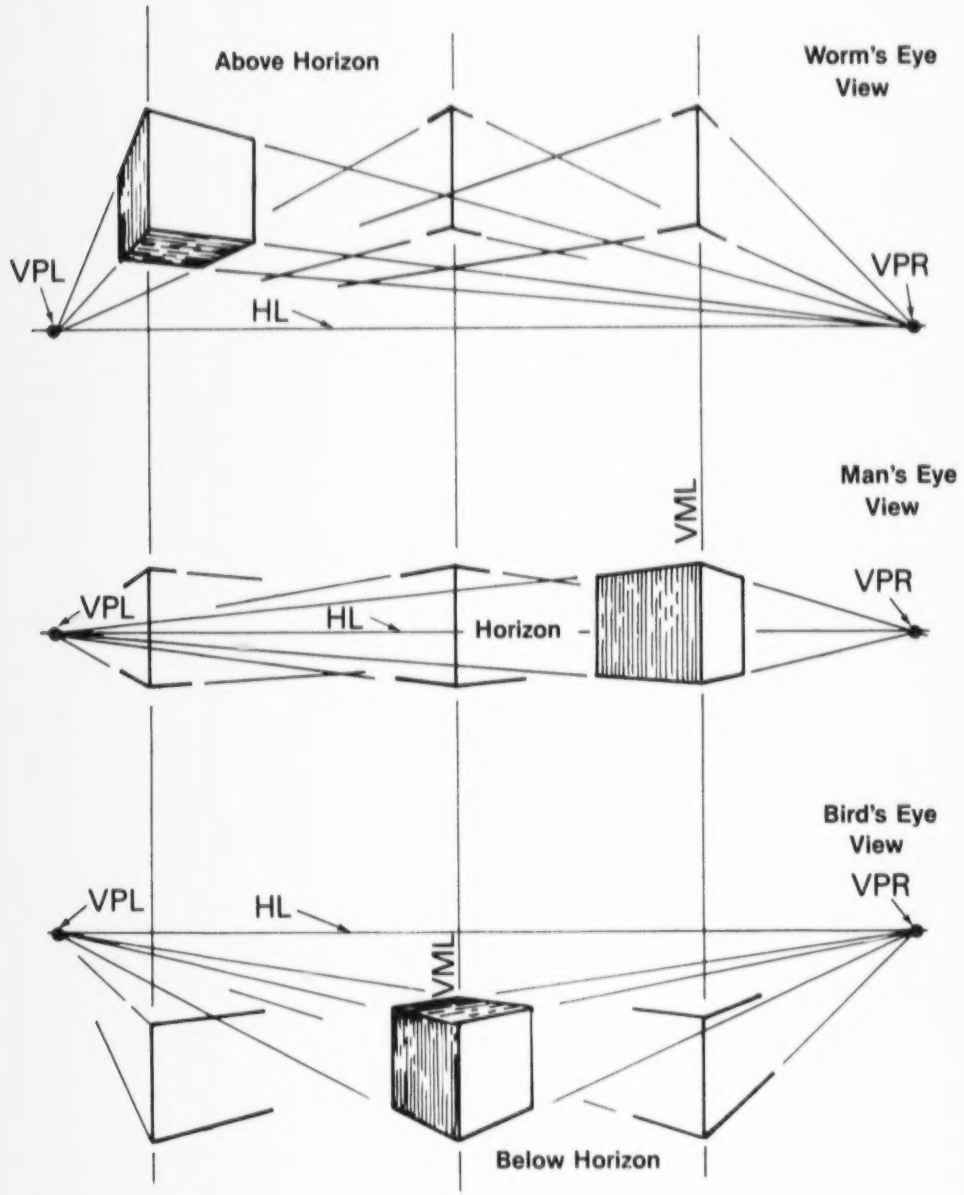
C. Perspective drawing — A drawing used by an architect, artist, or drafter to show an object as it would appear to the eye from a certain location

1. One-point, two-point, or three-point perspectives may be drawn depending on the number of vanishing points used.

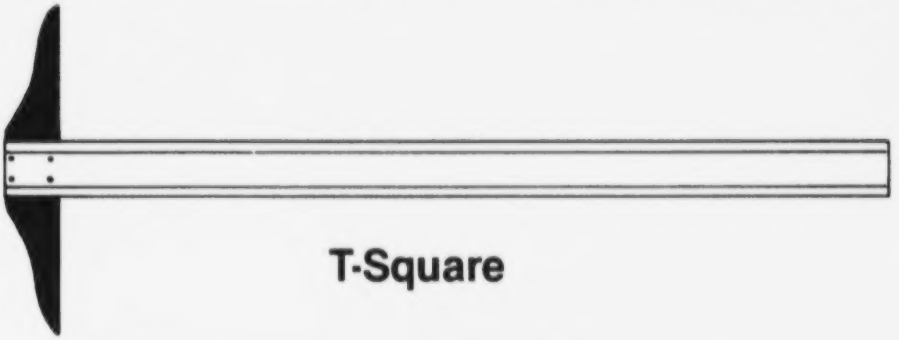


INFORMATION SHEET

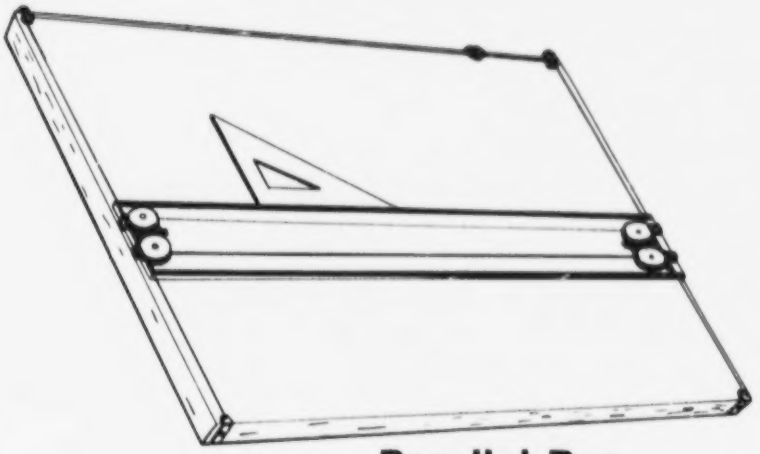
2. Perspectives may be drawn from three views depending on where the vanishing points are located — Worm's eye view, man's eye view, or bird's eye view.



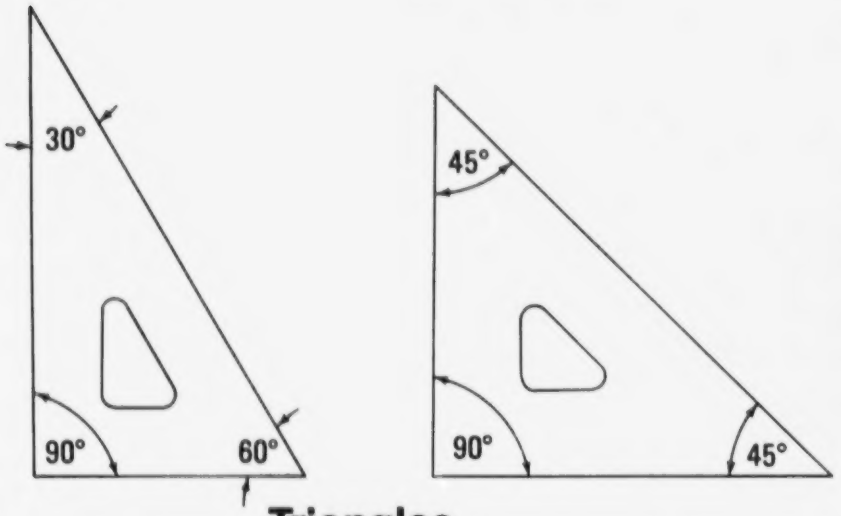
Manual Drafting Tools and Equipment



T-Square



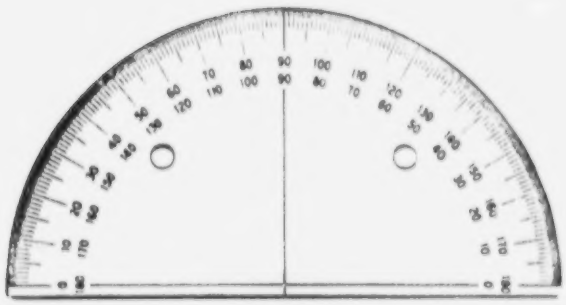
Parallel Bar



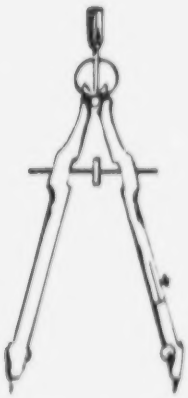
Triangles

Manual Drafting Tools and Equipment

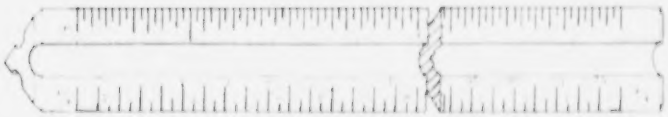
(Continued)



Protractor



Compass



Scale

(Several types available)

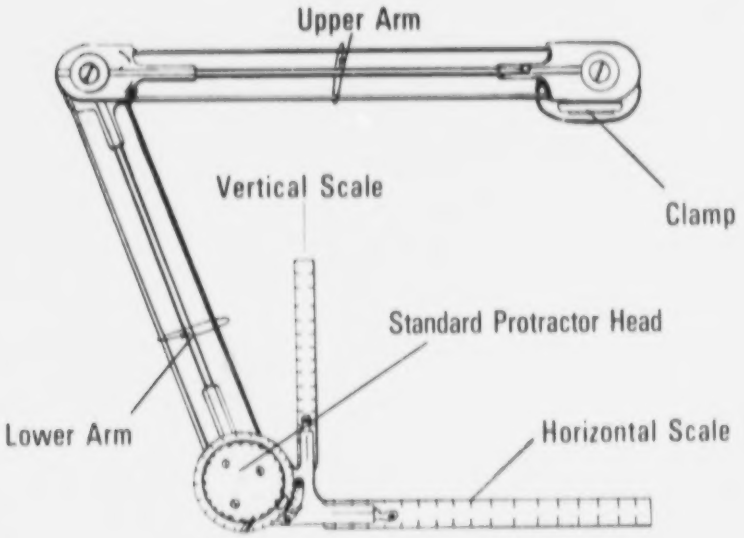
Eraser

Wooden

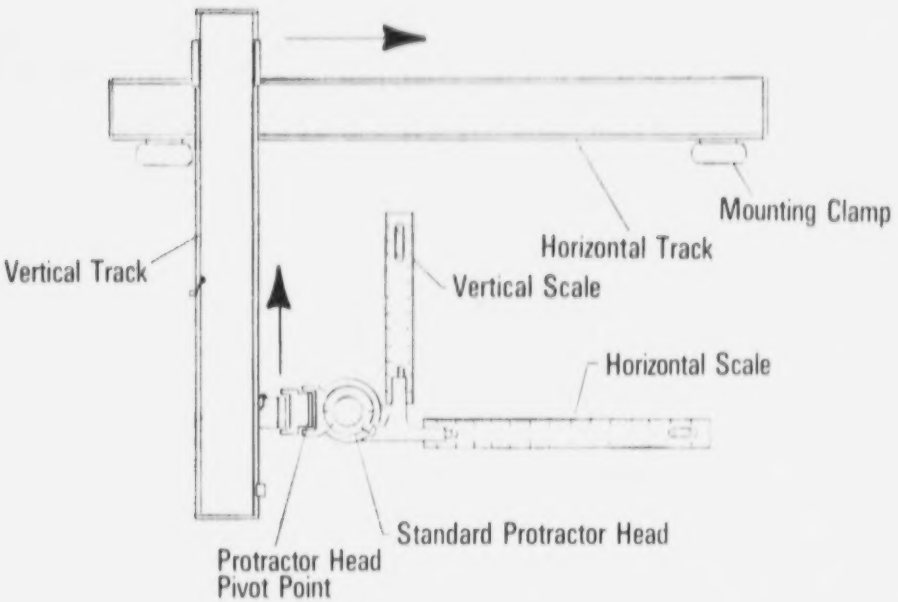
Mechanical

Pencils

Machine Drafting Equipment

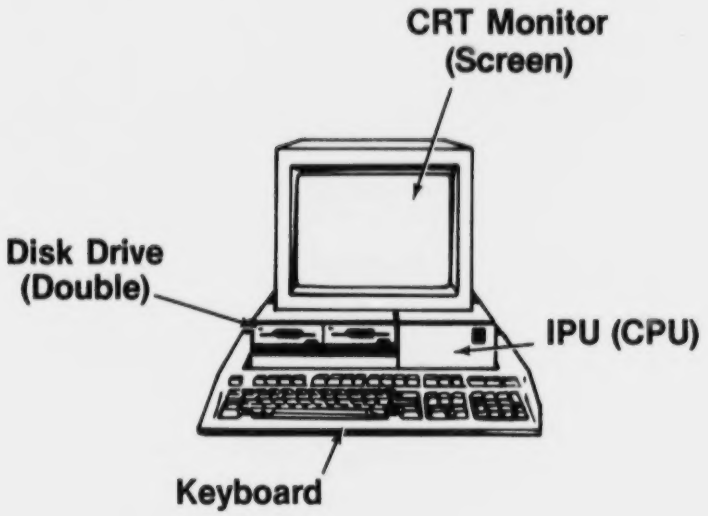


Arm Drafting Machine

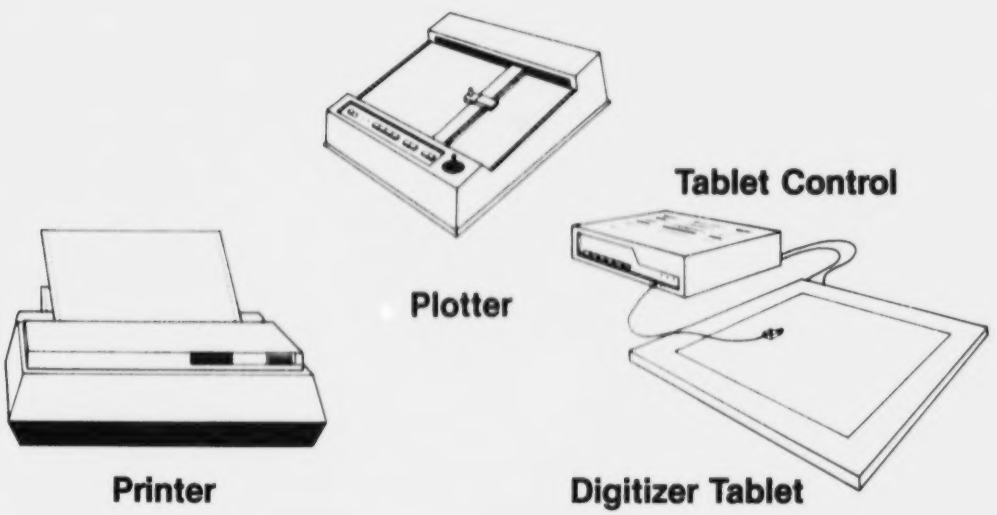


Track Drafting Machine

CAD Hardware

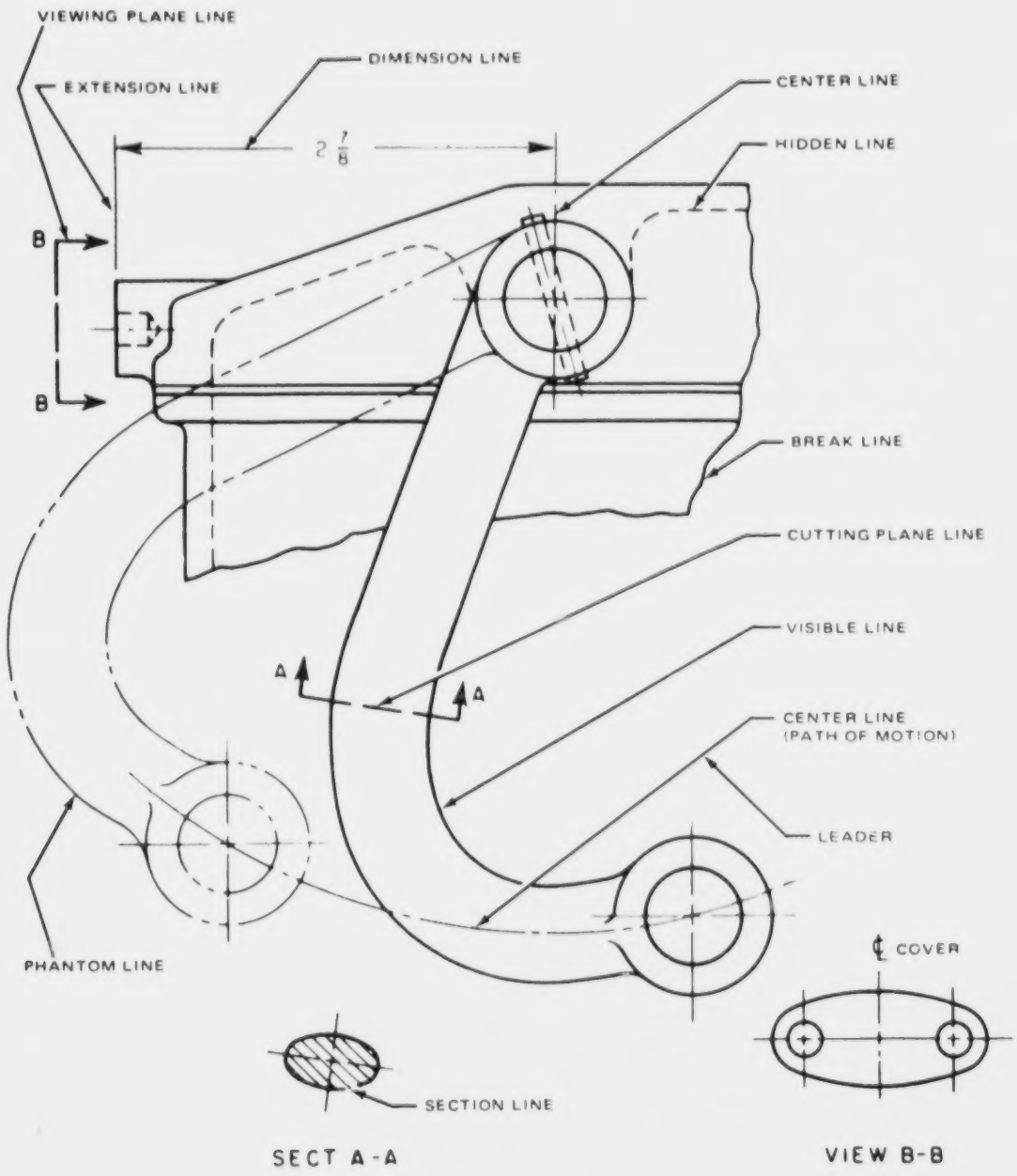


Basic Microcomputer System

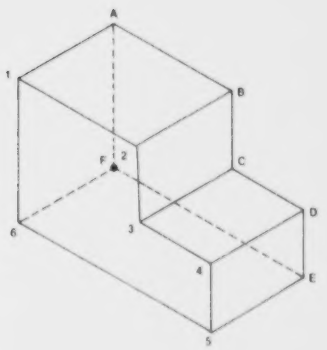


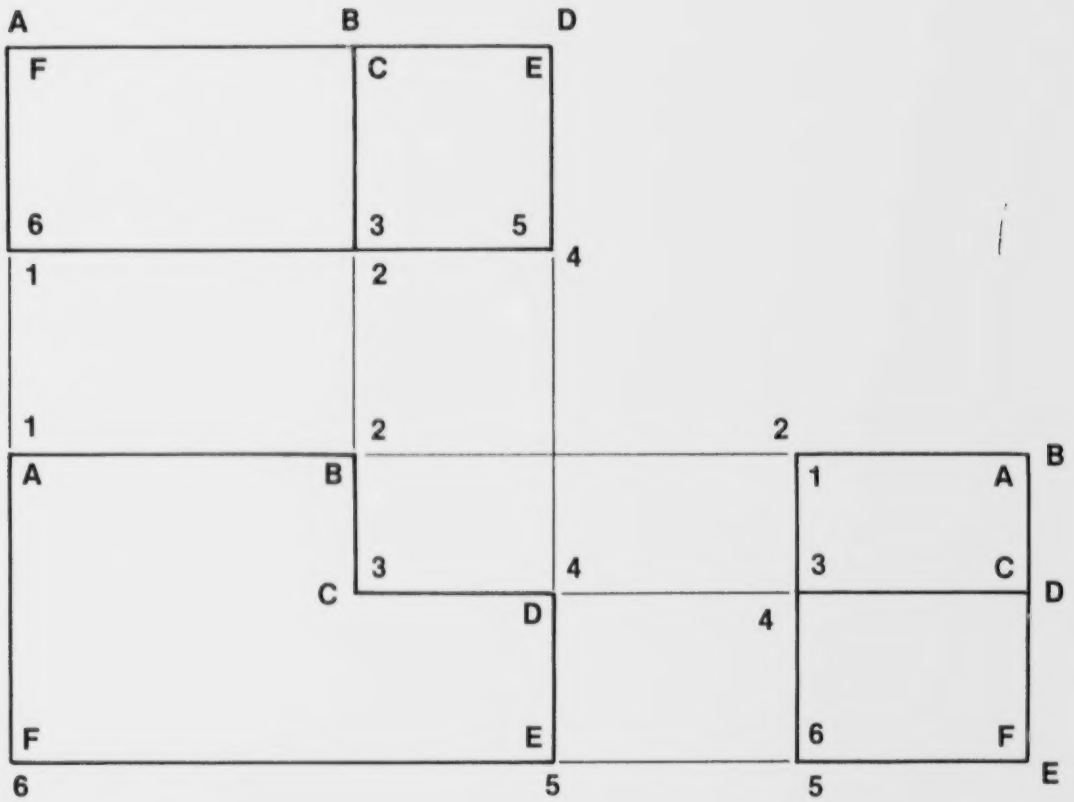
Optional Hardware

Use of the Alphabet of Lines



Transferring Points





(NOTE: All numbers/letters on outside of drawing are visible. Those numbers and letters placed on the view are invisible.)

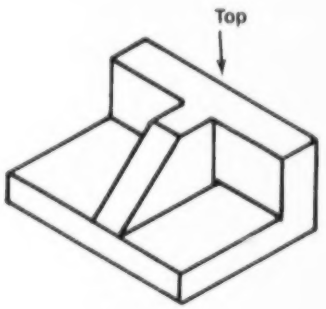
DRAFTING
UNIT IV

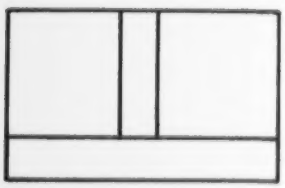
ASSIGNMENT SHEET #1 — SKETCH MISSING VIEWS

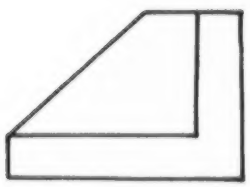
NAME _____ SCORE _____

Directions — Complete the missing views for the objects shown.

A.

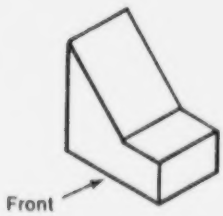


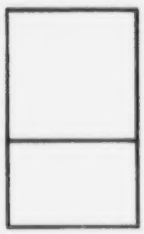




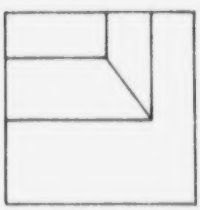
ASSIGNMENT SHEET #1

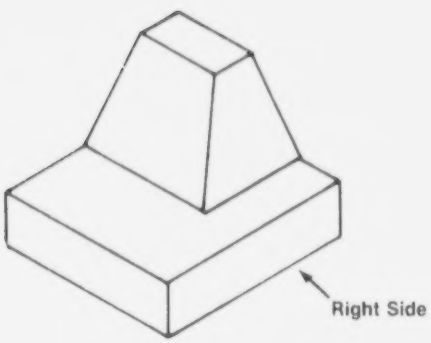
B.

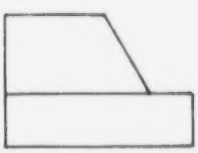




C.

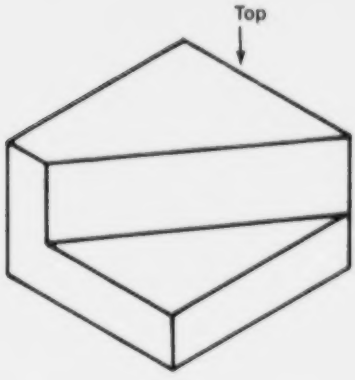


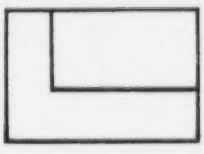


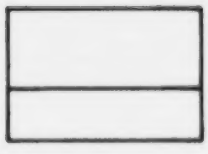


ASSIGNMENT SHEET #1

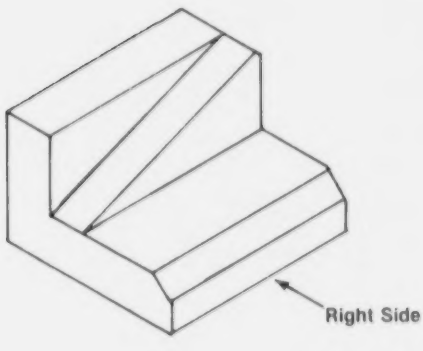
D.

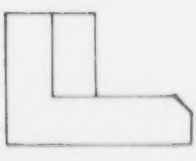






E.





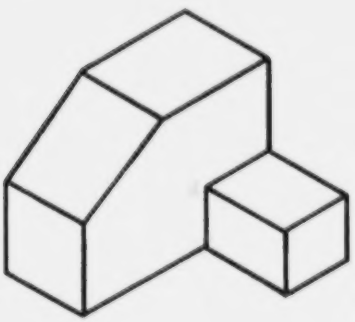
DRAFTING
UNIT IV

ASSIGNMENT SHEET #2 — PRODUCE ORTHOGRAPHIC PROJECTIONS

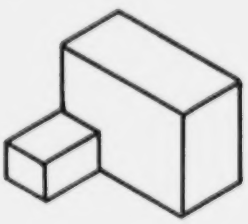
NAME _____ SCORE _____

Directions: Use the drafting equipment and media indicated by your instructor to produce orthographic projections (multiview drawings) of the objects shown below.

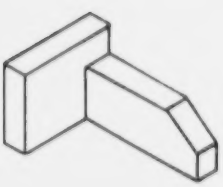
A.



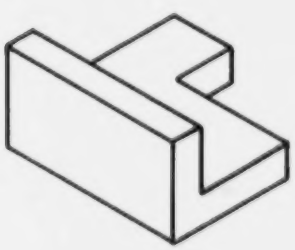
B.



C.



D.



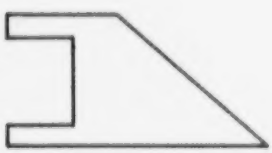
DRAFTING
UNIT IV

ASSIGNMENT SHEET #3 — PRODUCE AN ISOMETRIC DRAWING

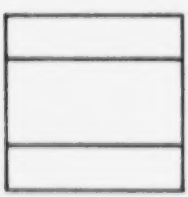
NAME _____ SCORE _____

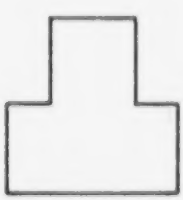
Directions: Produce isometric drawings of the following orthographic drawings.

A.



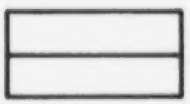
B.





ASSIGNMENT SHEET #3

C.



DRAFTING
UNIT IV

ASSIGNMENT SHEET #4 — PRODUCE AND PRINT A DRAWING USING CAD

NAME _____ SCORE _____

Directions: Using the appropriate user's manual for your CAD system and your instructor's directions, produce and print a drawing from Assignment Sheet #1, #2, or #3.

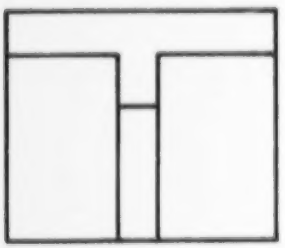
(NOTE: Review Objectives VIII and IX and Transparency 4 for CAD terminology and equipment.)

DRAFTING
UNIT IV

ANSWERS TO ASSIGNMENT SHEETS

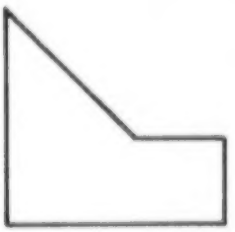
Assignment Sheet #1

A.



Top

B.

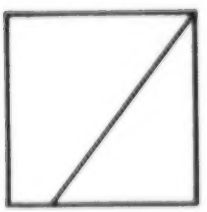


Front

C.

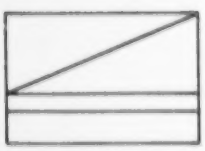
Right Side

D.



Top

E.

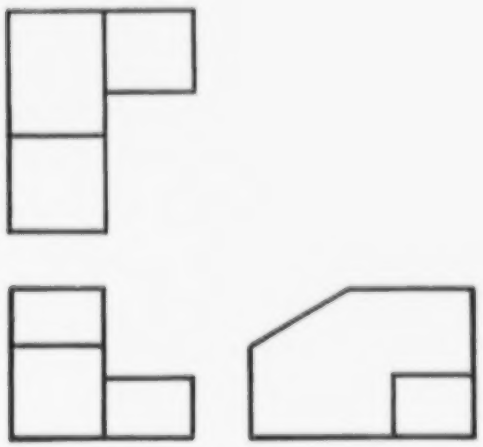


Right Side

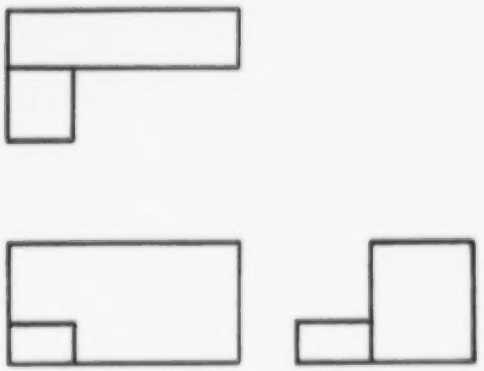
ANSWERS TO ASSIGNMENT SHEETS

Assignment Sheet #2

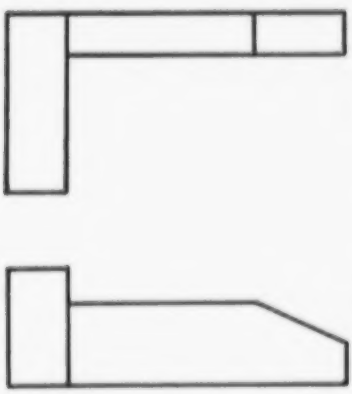
A.



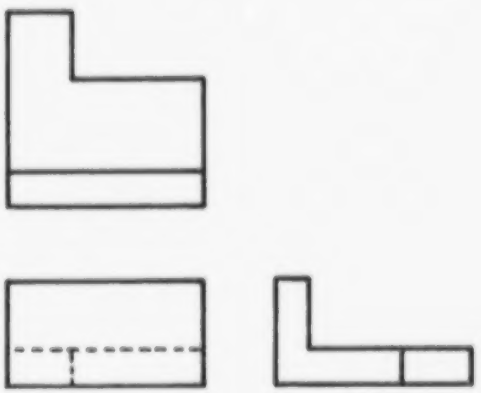
B.



C.



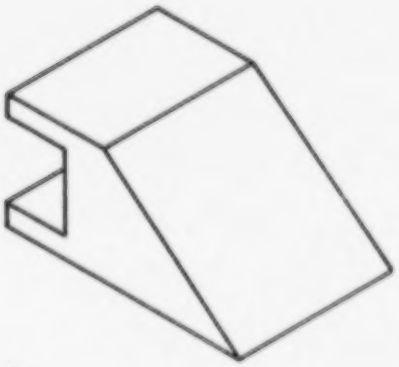
D.



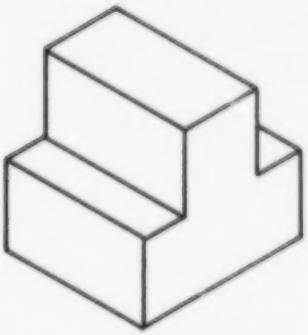
ANSWERS TO ASSIGNMENT SHEETS

Assignment Sheet #3

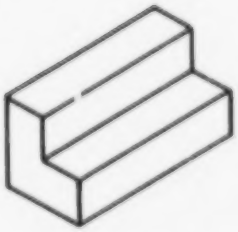
A.



B.



C.



Assignment Sheet #4 — Evaluated to the satisfaction of the instructor

DRAFTING
UNIT IV

NAME _____ SCORE _____

TEST

1. Match the terms on the right with the correct definitions.

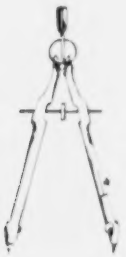
_____a.	A plane on which the points of an object are extended forward resulting in one view of the object	1. Acetate
_____b.	A surface that has a bright, polished finish	2. ANSI
_____c.	A clear plastic film which has no drafting surface	3. ASTM
_____d.	A drawing medium that is matte on one or both sides for a drafting surface; accepts both ink and pencil and comes in various mil thicknesses	4. Gloss
_____e.	Assumed plan view point representing the observer's eye	5. Matte
_____f.	A point toward which receding lines of sight converge in a perspective drawing	6. Medium
_____g.	Transmitting light without appreciable scattering so that bodies lying beyond are clearly visible	7. Mylar
_____h.	A slightly rough finish free from shine or highlights	8. Plane of projection
_____i.	Coordinates the development of many kinds of standards, including the currently accepted drafting standards	9. Polyester film
_____j.	A material used to carry information; in drafting, includes various papers and films used for written and drafted information	10. Station point
_____k.	A prepared tracing paper that has the strength and transparency to make a good drawing surface	11. Translucent
_____l.	Brand name of polyester film used as a base for drawing in the drafting industry	12. Transparent
		13. Vellum
		14. Vanishing point

TEST

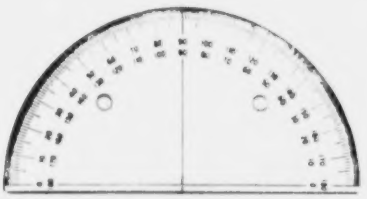
2. Identify the following manual drafting tools and equipment.

a. _____

b. _____



c. _____

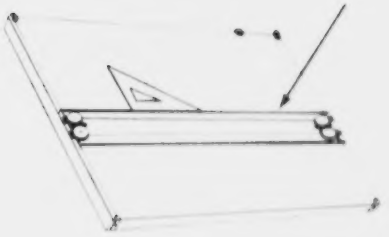


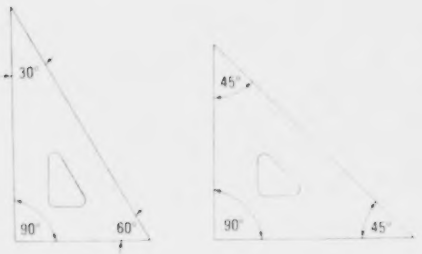
d. _____

e. _____

f. _____

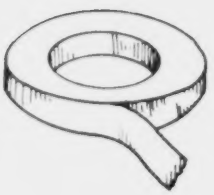
TEST



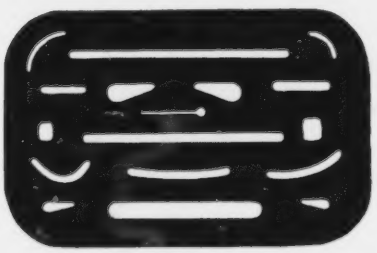


g. _____ h. _____

3. Identify the following manual drafting aids.

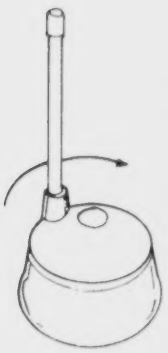


a. _____ b. _____



c. _____ d. _____

TEST



e. _____ f. _____

4. Match types of drafting media on the right with the correct descriptions.

_____a. Thin, untreated translucent paper used for quick notes or drawings; inexpensive

_____b. Thin, treated, translucent paper used for standard drafting work

_____c. Usually made by bonding a matte surface to one or both sides of a clean polyester sheet to form a tough, translucent drafting medium; is resistant to moisture, tearing, erasing, and general wear

_____d. Film or paper printed with black or blue 90° marks with single or double matte surfaces

1. Gridded media
2. Polyester drafting film
3. Tracing paper
4. Vellum

5. State the standard and alternate sizes for the following drafting sheets.

	Standard Size	Alternate Size
a. Sheet size A	_____	9″ × 12″
b. Sheet size B	11″ × 17″	_____
c. Sheet size C	_____	18″ × 24″
d. Sheet size D	_____	24″ × 36″
e. Sheet size E	_____	36″ × 48″

TEST

6. Select true statements concerning good drafting habits by placing a "T" next to the true statements and an "F" by the false ones.

_____a. Keep your instruments and equipment clean.

_____b. Keep the leads on your pencils dull so they won't smear.

_____c. Make sure your hands are clean before you start drafting.

_____d. Always slide equipment such as triangles and templates when moving them across your drafting sheet.

_____e. Keep everything on top of your table, even if that causes clutter, because it will save a lot of time.

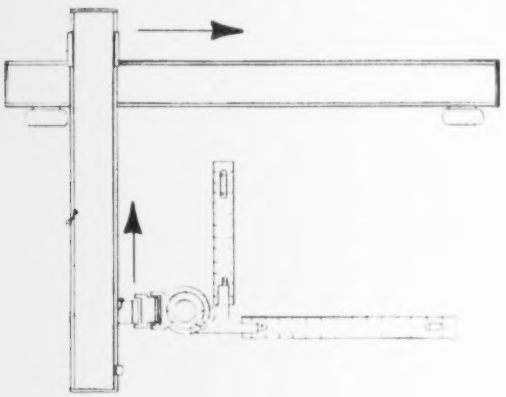
_____f. Use your hand to dust off your tabletop.

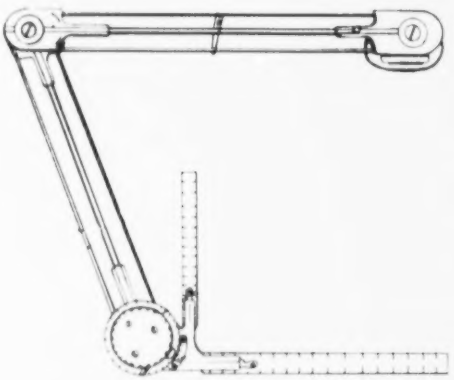
_____g. Store drawings folded up. Rolling them takes too much room.

_____h. Always use guidelines for lettering.

_____i. Always use your scale for drawing straight lines.

7. Identify the following types of machine drafting equipment.

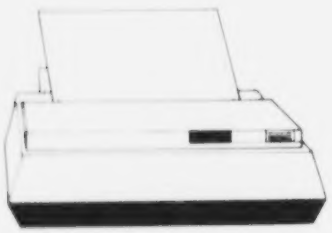


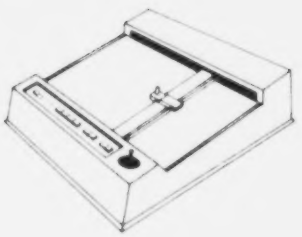


a. _____ b. _____

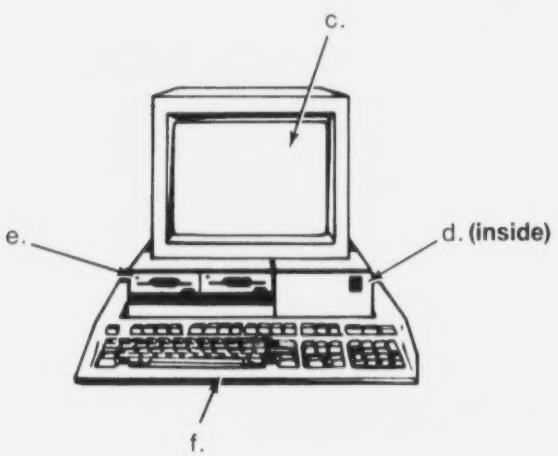
TEST

8. Identify the following CAD equipment (hardware).





a. _____ b. _____



c. _____

d. _____

e. _____

f. _____

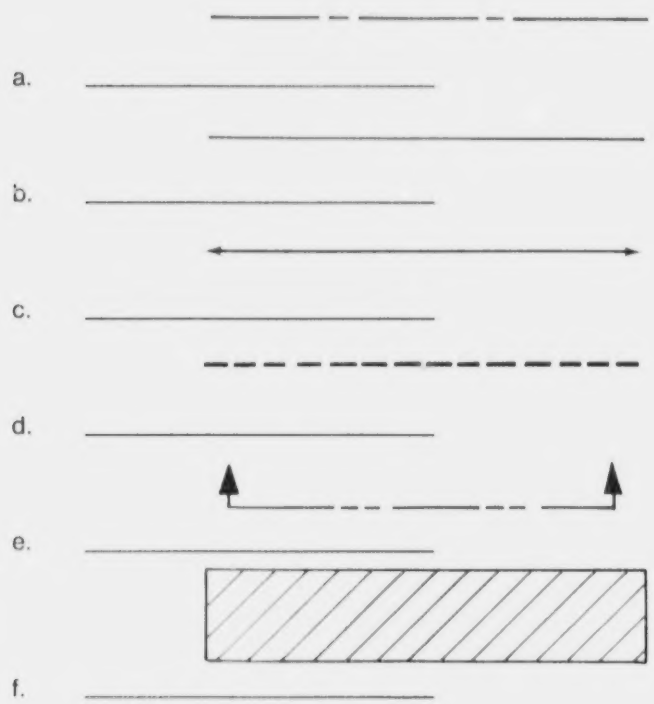
TEST

9. Match the CAD terminology on the right with the correct definitions.

_____a.	An electronic information-handling machine capable of performing arithmetical calculations and making logical decisions under the control of programs	1. Alphanumeric
_____b.	Information of all kinds	2. Bit
_____c.	Any physical equipment that is part of the CAD system	3. CAD
_____d.	Prepared programs that cause hardware to function	4. Computer
_____e.	Graphic symbols or information arranged in software to be retrieved at some later time	5. Cursor
_____f.	Data sent from a peripheral device to the CPU	6. Data
_____g.	Computer output that is composed of lines rather than letters, numbers, or symbols	7. Graphics
_____h.	Binary digit; the smallest unit of information that can be recognized by a computer	8. Hardware
_____i.	The letters A-Z, the numerals 0-9, and various punctuation marks and special characters	9. Input
_____j.	The interconnecting methods or devices used in the CAD hardware system	10. Interface
_____k.	Various devices used in a CAD system to input, store, retrieve, and output data to and from the CPU	11. Menu
_____l.	Data sent from the CPU to a peripheral device	12. Output
_____m.	Flashing rectangular dot or cross hair that indicates the current position on the screen	13. Peripheral devices
		14. Software

TEST

10. Identify lines used in drafting by selecting the correct name for each line from the list on the right.



a. _____

b. _____

c. _____

d. _____

e. _____

f. _____

Phantom line
Visible line
Section line
Dimension line
Center line
Cutting plane line
Hidden line

11. Distinguish between the two basic systems of linear measurement by placing an "X" next to the description of the metric system.

_____a. The international system of measurement

_____b. Primarily used in the U.S.

_____c. Basic unit is an inch

_____d. Basic unit is a meter

12. Select from the following list the factors that make a good drawing by placing an "X" next to the correct factors.

_____a. Corners of drawing are sharp.

_____b. Drawing is messy.

_____c. Drawing is readable and accurate.

_____d. Title block is complete.

TEST

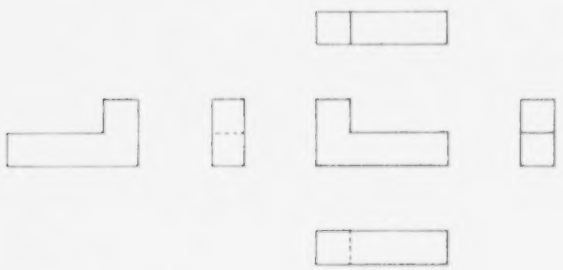
_____e. All line weights are thick.

_____f. All of drawing is located on the left side of sheet so notes can be added later to right side.

_____g. Drawing is well centered.

_____h. Lettering is legible and uniform.

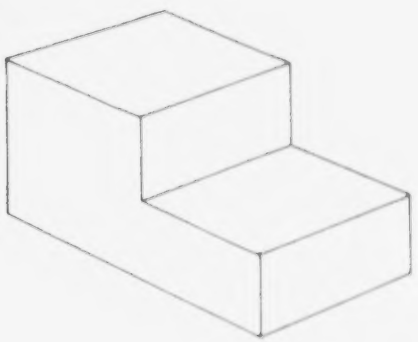
13. Identify the principal views used in orthographic projection for the figure below. Place your answers below each illustration. Then draw an "X" over the unnecessary views.



14. Match the major types of pictorial drawings on the right with the correct illustrations.

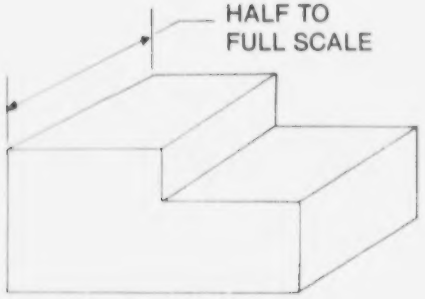
_____a.

1. Perspective
2. Isometric
3. Oblique

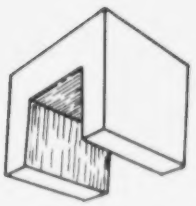


TEST

_____b.



_____c.



(NOTE: If the following activities have not been accomplished prior to the test, ask your instructor when they should be completed.)

15. Sketch missing views. (Assignment Sheet #1)

16. Produce orthographic projections. (Assignment Sheet #2)

17. Produce isometric drawings. (Assignment Sheet #3)

18. Produce and print a drawing using CAD. (Assignment Sheet #4)

DRAFTING
UNIT IV

ANSWERS TO TEST

1.
a.	8	g.	12
b.	4	h.	5
c.	1	i.	2
d.	9	j.	6
e.	10	k.	13
f.	14	l.	7

2.
a. Pencils
b. Scale
c. Compass
d. Protractor
e. T-square
f. Eraser
g. Parallel bar
h. Triangles

3.
a. Template
b. Drafting tape
c. Erasing shield
d. Irregular (French) curve
e. Lead pointer
f. Brush

4.
a. 3
b. 4
c. 2
d. 1

5.
a. 8½" × 11"
b. 12" × 18"
c. 17" × 22"
d. 22" × 34"
e. 34" × 44"

6. a, c, h

7.
a. Track-type
b. Arm-type

8.
a. Printer
b. Plotter
c. Monitor
d. IPU (CPU)
e. Disk drive
f. Keyboard

ANSWERS TO TEST

9.

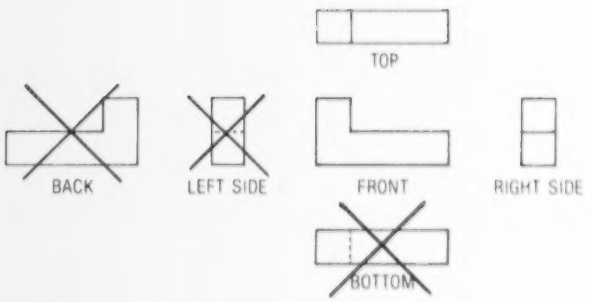
a.	4	f.	9	k.	13
b.	6	g.	7	l.	12
c.	8	h.	2	m.	5
d.	14	i.	1		
e.	11	j.	10		

10.
a. Center line
b. Visible line
c. Dimension line
d. Hidden line
e. Cutting plane line
f. Section line

11. a, d

12. a, c, d, g, h

13.



14.
a. 2
b. 3
c. 1

15.-18. Evaluated to the satisfaction of the instructor

GRAPHIC REPRODUCTION
UNIT V

UNIT OBJECTIVE

After completion of this unit, the student should be able to design and reproduce graphic messages using copying and printing processes. Competencies will be demonstrated by completing the assignment sheets, job sheet, and the unit tests with a minimum of 85 percent.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Match terms related to graphic reproduction with the correct definitions.
2. Distinguish between the two basic types of graphic reproduction.
3. Complete statements concerning the common methods of copying.
4. Match the major printing processes with the correct descriptions.
5. Arrange in order the stages in the printing process.
6. Identify basic styles of type.
7. Match variations of type with the correct illustrations.
8. Complete statements concerning the units for measuring type.
9. Distinguish between hot and cold type composition.
10. Select true statements concerning graphics laboratory safety rules.
11. Identify type styles in printed material. (Assignment Sheet #1)

OBJECTIVE SHEET

12. Design and reproduce a message using a copying process. (Assignment Sheet #2)
13. Design and prepare a message for a printing process. (Assignment Sheet #3)
14. Demonstrate the ability to make a screen print. (Job Sheet #1)

GRAPHIC REPRODUCTION
UNIT V

SUGGESTED ACTIVITIES

A. Obtain additional materials and/or invite resource people to class to supplement/reinforce information provided in this unit of instruction.

(NOTE: This activity should be completed prior to the teaching of this unit.)

B. Make transparencies from the transparency masters included with this unit.

C. Provide students with objective sheet.

D. Discuss unit and specific objectives.

E. Provide students with information and assignment sheets.

F. Discuss information and assignment sheets.

G. Provide students with job sheet.

H. Discuss and demonstrate the procedure outlined in the job sheet.

I. Integrate the following activities throughout the teaching of this unit:

1. Assign students individually or in groups to research and report on early printing in America.

2. Have students select an area in modern day printing and project how it might change in the years to come. Discuss with the class.

3. Plan a visit to a local newspaper or printing company.

4. Research and prepare a model of an early Egyptian scroll.

5. Prepare for the AIASA competitive events of designing safety posters and graphics logos using the assignment and job sheets in this unit.

6. Have students select a business they would like to own in the future. Design an advertisement, business card, or stationery for that business.

7. Plan to utilize the thermo screen printing process as an alternate method. This is available from: Welsh Products, Inc., 1201 East 5th Street, P.O. Box 845, Benicia, California 94510, telephone (707) 745-3252 or 554-3222.

8. Stress laboratory safety in all areas of activity.

9. Use a video digitizer to produce computer pictures and/or T-shirt heat transfers. This may be done using a printer with transfer ribbons.

10. Meet individually with students to evaluate their progress through this unit of instruction, and indicate to them possible areas for improvement.

SUGGESTED ACTIVITIES

J. Administer test.

K. Evaluate test.

L. Reteach if necessary.

REFERENCES USED IN DEVELOPING THIS UNIT

A. Jones, Ronald E. and Janet L. Robb. *Discovering Technology Communication.* Dallas, TX: Harcourt Brace Jovanovich Publishers, 1986.

B. Walker, John R. *Graphic Arts Fundamentals.* South Holland, IL: Goodheart-Willcox Company, Inc., 1980.

C. *Competitive Events Guidelines.* National AIASA, Reston, VA, 1985.

SUGGESTED SUPPLEMENTAL RESOURCES

Videocassette Tapes

A. *The Making of a Magazine,* 1982, 13 min., color

B. *Conceptualization and Copy Development,* 1982, 15 min., color

C. *Layouts and Mechanicals,* 1982, 15 min., color

D. *An Overview of the Printing Process,* 1982, 15 min., color

A-D are available from:
Oberlin Color Press
100 West Airport Road
Stillwater, OK 74075-1699
(405) 743-2840

E. *Photographic Processing,* CS-162
Photographic and motion picture processing laboratories are the subject of this video program. Such operations as color timers, printer operators, film mounters, copy cameramen, and developing machine operators are examined. Also included, discussion of optical sound transfer in context with the overall working environment. Internal training programs and the unique working conditions are introduced.

F. *Printing,* CS-163
The people of the printing industry are featured in various printing and binding operations. The different duties and processes are discussed by those who are responsible for the operation of the equipment. A union rep comments on the overall industry and opportunities in general.

E and F are available in VHS and Beta from:
Morris Video
413 Avenue G, #1
P.O. Box 443
Redondo Beach, CA 90277
1 800 843-3606

SUGGESTED SUPPLEMENTAL RESOURCES

Computer Software Programs

A. *Print Shop* — Simple to use. Writes, designs, and prints business cards, letterheads, notices, etc. Teaches layout technique. Has different type styles, borders, and clip art. Available for IBM, Apple II, Macintosh, and Apple family hardware.

B. *Newsroom* — Designs, produces, and prints newspapers. Has a large clip art library. Available for Apple II, Apple family, and IBM hardware.

C. *Computer Eyes II* — Creates real world images by hooking a video camera to a computer and digitizes the picture onto paper. Available for Apple II and IBM hardware.

The above software as well as many others are available from your local computer center, computer magazines, or the following:

Pitsco
Box 1328
Pittsburg, KS 66762
1-800-835-0686

D. MACVision — Video digitizing device which uses a radio signal and converts it to digits so the microcomputer can use or store it. The image can then be printed. Ideal for a type of screen printing. This is available from local software stores.

GRAPHIC REPRODUCTION
UNIT V

INFORMATION SHEET

I. **Terms and definitions**

A. Binding — The process of fastening together printed materials

B. Camera-ready (mechanical) copy — Type and artwork pasteup that is ready to be photographed in preparation for printing

C. Copyfitting — The process of calculating the amount of copy that will fit into a certain amount of space

D. Electronic desktop publishing — Using a computer and appropriate software to layout, typeset, and print publications

E. Font — Complete set of one size and style of type

F. Image carrier — An object or material that carries the image during printing; receives ink to print on the desired surface

G. Line work — Artwork or type that contains only black and white tones (no gray tones)

H. Phototypesetting — Producing cold type using a photographic process

I. Serifs — The small cross strokes that project out from the main letter strokes

Example:

J. Sheet fed press — Press used to produce high-quality single and multiple color printed material

K. Signature — A large sheet of paper that has been folded several times and then cut to produce a series of pages

L. Typeface — A particular style of letters, numbers, and punctuation marks used in printing

Examples: Roman, Avant Garde, Century, Helvetica

M. Web press — A multi-purpose press that prints from rolls of paper

INFORMATION SHEET

II. **Two basic types of graphic reproduction** (Transparency 1)

A. Copying

1. Original material is exposed to photosensitive material for reproduction.

2. One copy is made for each exposure.

3. Used when smaller quantities are needed. (1 to 50 copies, occasionally more)

B. Printing

1. Specially prepared image carriers (plates) are made from the original material.

2. Mechanical presses are used for transferring ink or dye from the image carrier to the paper or other medium.

3. Used when larger quantities are needed. (100 to many 1000's of copies)

III. **Common methods of copying (inkless processes)**

A. Blueprinting (wet process)

1. Original drawing is placed on specially coated blueprint paper, and both are then exposed to a light source.

2. The blueprint paper is washed in water which changes the paper to blue except for the imprints of lines from the original drawing which are white.

3. Blueprint is then dried.

4. Finished copy is blue with white lines.

B. Diazo processing (dry process)

1. Original drawing is placed on specially coated diazo paper, and both are then exposed to a light source. Light destroys diazo coating except for what is hidden under lines of original drawing.

2. The diazo sheet is then exposed to ammonia vapors which turns lines imprinted from original drawing to blue lines.

3. Finished copy is white with blue lines.

INFORMATION SHEET

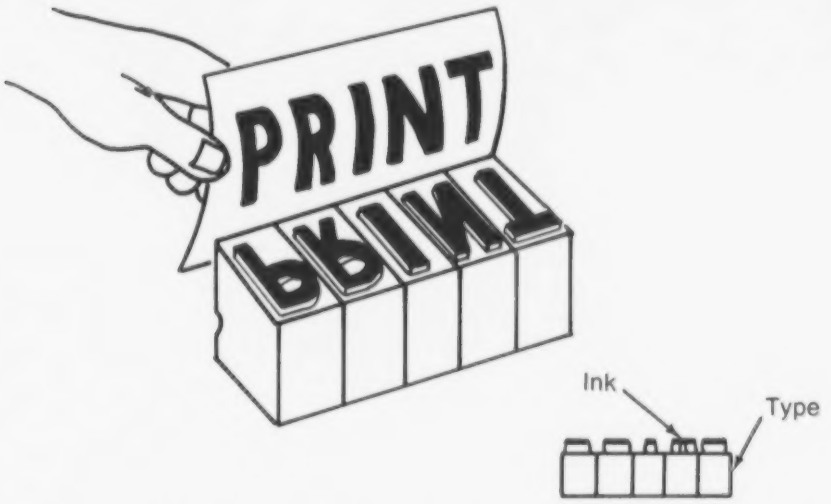
C. Xerography — A dry process which makes use of electrostatic forces on a selenium plate to produce the image.

(NOTE: This process was originally developed by the Xerox Corporation, hence the name xerography. There are now many other companies which use this process for their copying machines. Some machines can make enlargements or reductions of the original as well as copy in color.)

IV. **Major printing processes** (ink processes)

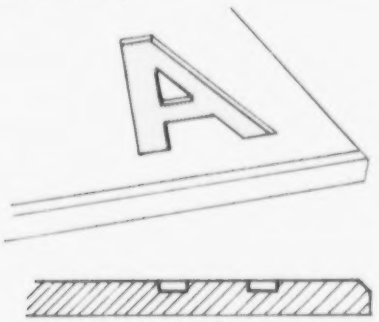
A. Relief printing (letterpress) — Printing directly from raised letters, inked and pressed against paper surface

(NOTE: Messages are reversed on the letterpress image carrier. When printed, the message will read correctly.)



B. Gravure printing (intaglio) — A printing process where the recessed image area is made by engraving, etching, or scratching

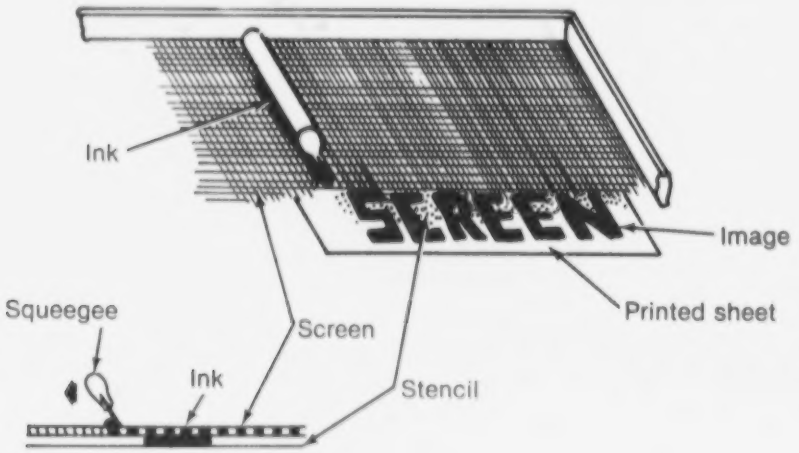
(NOTE: Photography and a chemical process are often used to make the recessed image area. Paper money, stamps, and special catalogs are produced by this method.)



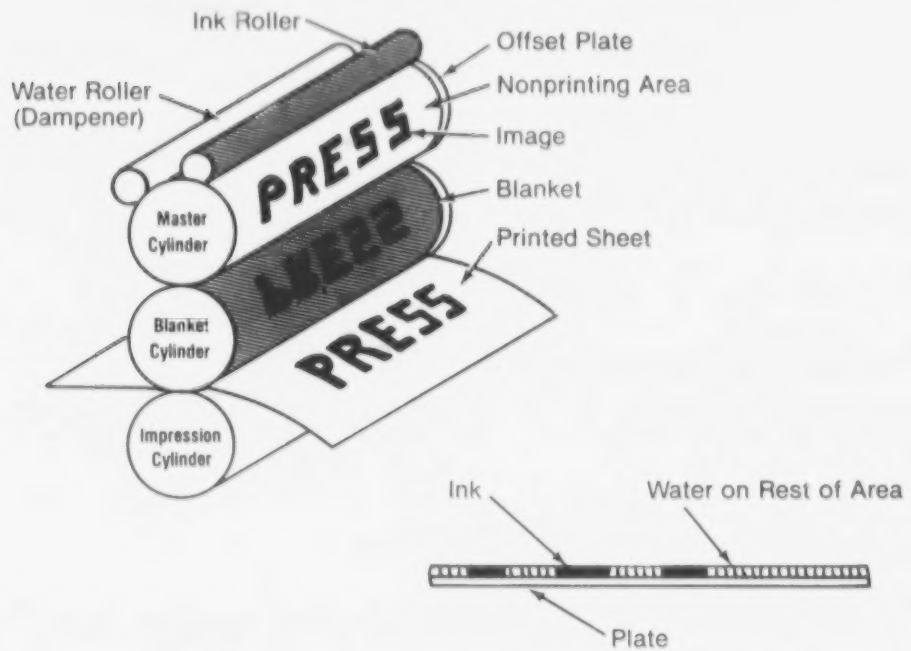
Depressed Printing Surface

INFORMATION SHEET

C. Screen printing (also called silk screening or stencil printing) — Printing directly from a stencil through a finely woven, cloth or wire mesh screen



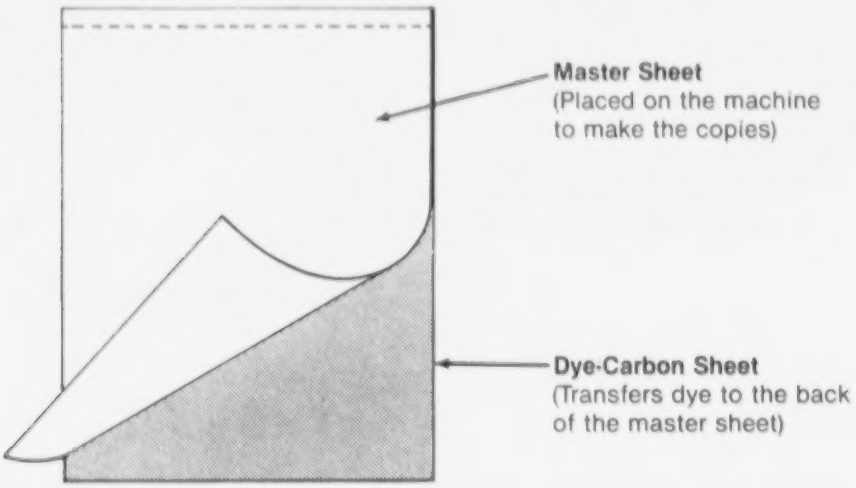
D. Offset printing (lithography) — The process of printing from a flat surface with the image and nonimage areas kept separated by chemistry. (Grease and water do not readily mix.) So named because the image is first received by a blanket and is then transferred to the sheet to be printed.



INFORMATION SHEET

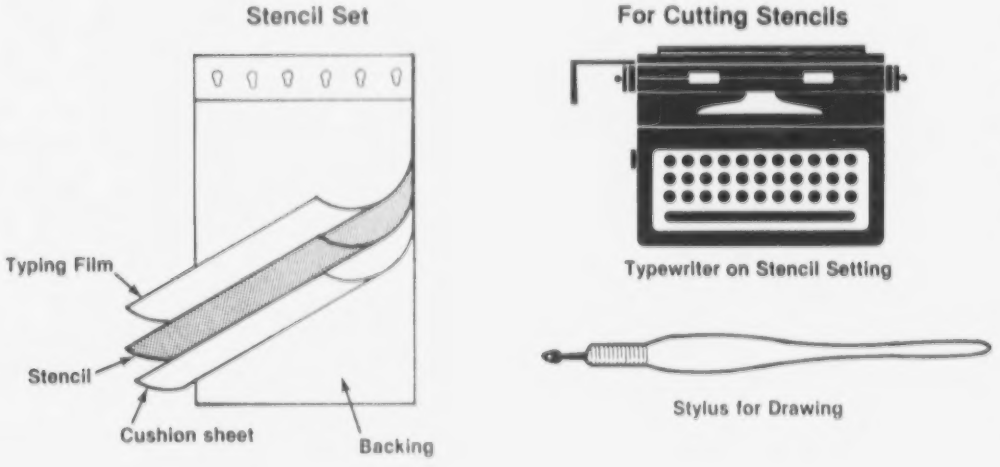
E. Spirit duplicating — Uses a chemical fluid (spirit) coming into contact with copy paper that is pressed against a master sheet containing soluble dye.

(NOTE: The master sheet [image carrier] will print about 300 copies before the dye-carbon coating is gone.)



F. Mimeograph (stencil) duplicating — Printing by forcing ink through a stencil coming in contact with copy paper. The stencil is a sheet of porous tissue coated with a special ink-repelling wax which, when it is typed or drawn on, separates and allows the ink to pass through.

(NOTE: Stencils will run approximately 5,000 copies before they begin to fail.)



(NOTE: The typing film and cushion sheet are not used for drawing, tracing, or shading illustrations.)

INFORMATION SHEET

V. Stages in the printing process

A. Original image (camera-ready copy) is developed.

B. Printing image carrier is made from the original image.

C. Printing image carrier is inked.

D. Inked image is transferred (printed) onto selected material (paper, cloth, plastic).

VI. Basic styles of type (Transparency 2)

A. Roman

1. May be old style, transitional, or modern.

2. All have serifs.

3. All have heavy and light elements.

Old Style Roman **Transitional Roman** **Modern Roman**

B. Gothic

1. Also known as sans-serif.

   (NOTE: The French word *sans* means *without*; therefore, the term sans-serif means without serifs.)

2. Very simple type style.

INFORMATION SHEET

3. All strokes are nearly uniform.

Gothic or Sans Serif

C. Square serif

1. Blocked or square serifs
2. Uniform strokes

Square Serif

D. Text

1. Heavy, bold appearance
2. Styled after ornate hand lettering used hundreds of years ago.
3. Difficult to read. Should not be used in all caps.

Text

INFORMATION SHEET

E. Script

1. Hand writing or hand-lettering effect
2. Sometimes known as "cursive."
3. Difficult to read. Should not be used in all caps.

Script

F. Special

1. Unusual designs commanding attention.
2. Used primarily for display lines only.
3. Also called novelty or decorative.

Special

VII. Variations of type

A. Different weights — Light, medium, bold, ultrabold (or heavy)

B. Different widths — Regular, expanded, condensed

INFORMATION SHEET

C. Italics — Are slanted versions of a type face; almost every face has an italic version. Italics may be combined with different weights or widths.

Examples:

Futura Lt ABCDEFGHIJKLMNOPQRSTUV

Futura Lt Ital ABCDEFGHIJKLMNOPQRST

Futura Bld ABCDEFGHIJKLMNOP

Futura Bld Cond ABCDEFGHJKLMNOPORSTUVW

Futura Bld Ital ABCDEFGHJKLMN

Futura Exbld Cond ABCDEFGHIJKLMNOP

Futura Exbld Cond Ital ABCDEFGHJKLMN

Futura Exbld Ital ABCDEFGHIJ

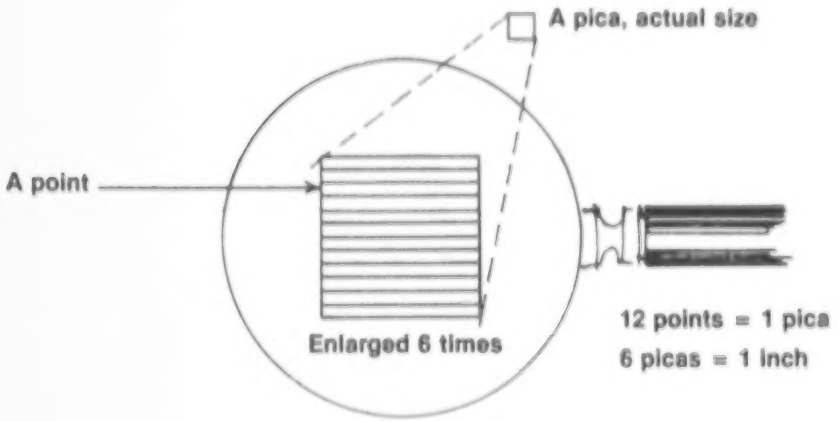
VIII. Units for measuring type

A. Point

1. Smallest unit of measurement
2. Used to measure type body size and leading
3. Approximately $^{1}/_{72}$ of an inch

B. Pica

1. Equal to exactly 12 points
2. Used to measure line length
3. Six picas equal approximately one inch.



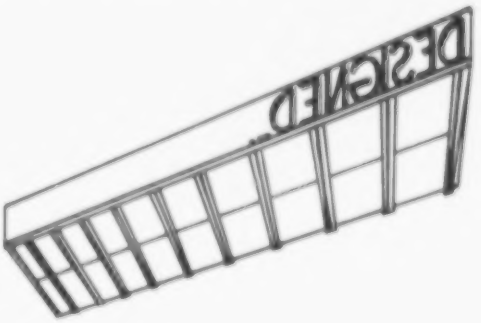
INFORMATION SHEET

IX. Characteristics of hot and cold type composition

A. Hot type

1. Mold or pattern from which characters can be printed.
2. Three-dimensional type.
3. Printed directly onto surface of paper.
4. Also known as "relief" composition.

   Examples: Foundry type, linotype, Ludlow type



B. Cold type

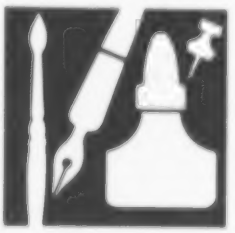
1. Any copy that can be photographed.
2. Usually printed indirectly (set off from plate).
3. Two-dimensional image

   Examples: Clip art, hand lettering and art, preprinted type, "strike-on" typing, phototypesetting

Phototypeset Type

Handlettering

Transfer Type



Clip Art

INFORMATION SHEET

X. **Graphics laboratory safety rules** (Transparency 3)

A. General rules

1. Work in a well-ventilated area.

   (NOTE: Fumes may be toxic!)

2. Wear safety glasses as needed, especially when mixing or pouring chemicals.

3. Wear protective gloves as needed, especially when handling chemicals.

4. Read container labels carefully before using products. Do not use products that are unlabeled.

5. Wear clothing appropriate to the work involved.

6. Return all supplies to their correct storage places after using them.

B. Equipment rules

1. Do not use any equipment until you understand how to use it thoroughly.

2. Do not use any equipment that you do not have permission from your instructor to use.

3. Make sure all safety guards are being used as required.

4. Never reach into the equipment while it is running. (Transparency 3)

5. Never walk away from equipment that is running.

6. When finished with a machine, turn off the power and wait until it comes to a complete stop before leaving.

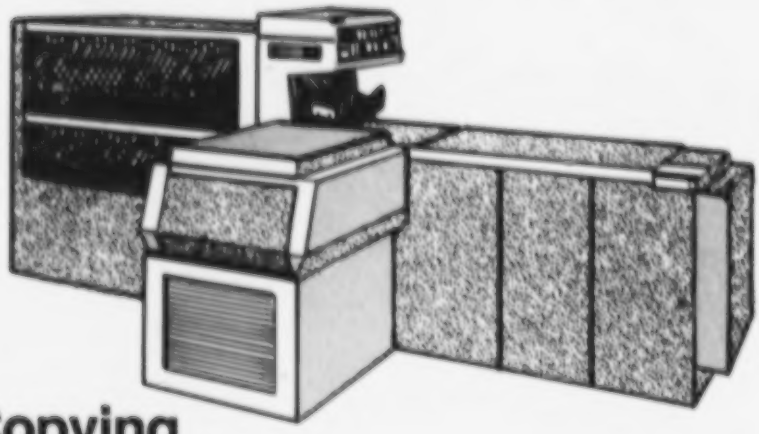
7. Remove ties, scarves, loose clothing such as jackets, and jewelry before operating the equipment. (Transparency 3)

8. Always keep your hands away from the machine's moving parts.

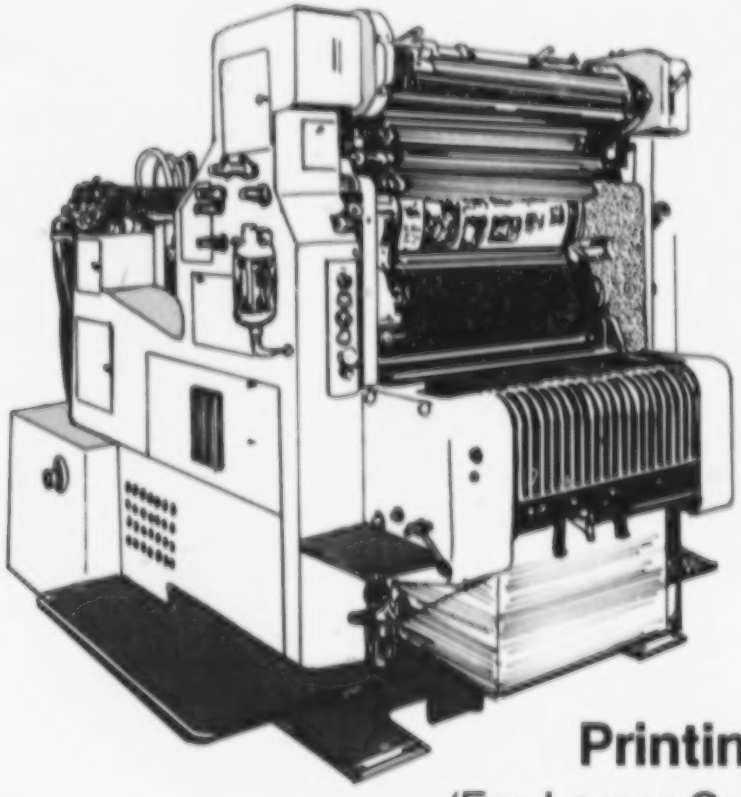
9. Keep the floor around the equipment clean.

10. Report all strange noises or faulty operation of machines to your instructor.

Types of Graphic Reproduction



Copying
(For Smaller Quantities)



Printing
(For Larger Quantities)

Styles of Type

Bodoni Book ABCDEFGHIJKLMNOPQRSTU 12
Caledonia ABCDEFGHIJKLMN 12
Cooper Old Style ABCDEFGHIJKLM 12

Roman

Clarendon Bd Ex 12
Karnak Black Condensed ABCDEFGHIJKL 12
Stymie Medium ABCDEFGHIJKLM 12

Gothic or Sans Serif

Bank Script ABCDEFG 12
Stradivarius ABCDEFGHIJ 12
Liberty ABCDEFGHIJ 12

Script

Helvetica Bld Ext ABCDEFGH 12
Impact ABCDEFGHIJJKLMNOPQR 12
Standard Extra Lt Ext ABCDEF 12

Square Serif

Old English ABCDEFGHIJKLMNO 12
American Text ABCDEFGHIJKLMNOPQR 12
Wedding Text ABCDEFGHIJKLMNOPQ 12

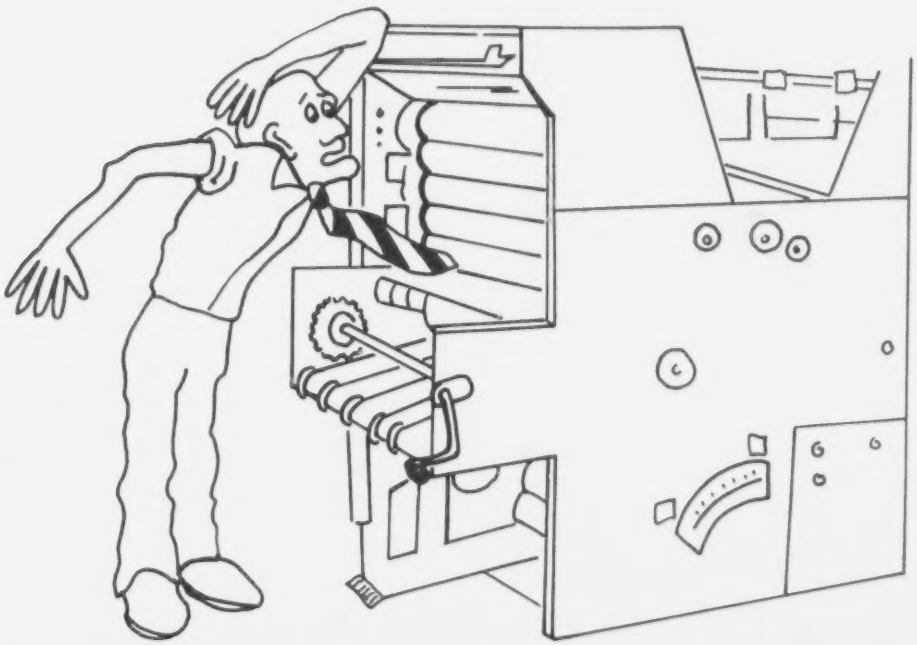
Text

Charleston ABCDEFGHIJKLMN 12
FONTANA NUST ABC 12
GRAPHIQUE ABCDEFGHIJKLMNOPQRSTUV 12
THUND AB 12
STENCIL ABCDEFG 12

Special

Use Equipment with Care

Never reach into the equipment while it is running.



Remove ties, scarves, loose clothing, and jewelry before operating the equipment.

GRAPHIC REPRODUCTION
UNIT V

ASSIGNMENT SHEET #1 — IDENTIFY TYPE STYLES IN PRINTED MATERIAL

NAME _____ SCORE _____

Directions: From magazines and newspapers, locate examples of the six different type styles listed below. Paste these on the sheet and label with the appropriate names.

A. Roman

B. Gothic

C. Square serif

D. Text

E. Script

F. Special

GRAPHIC REPRODUCTION
UNIT V

ASSIGNMENT SHEET #2 — DESIGN AND REPRODUCE A MESSAGE USING A COPYING PROCESS

NAME _____ SCORE _____

Directions: Design a message that can be reproduced using a blueprinting or diazo process or by xerography (electrostatic copying).

Blueprinting and diazo copying are primarily designed for drafting illustrations. Check with your instructor for specific operating instructions and availability of this equipment.

Xerography will be suitable for *many* designs such as small safety posters, bulletin board notices, advertising flyers, menus, programs, or stationery or business cards with logo you've designed for your company. Check with your instructor for specific operating instructions and availability of this equipment.

Your design will be evaluated in the following areas:

— Eye appeal	10 pts max
— Message content	10 pts max
— Originality	10 pts max
— Organization	10 pts max
— Interest	5 pts max
— Neatness	5 pts max
— Proper use of equipment	50 pts max
Total	100 pts max

GRAPHIC REPRODUCTION
UNIT V

ASSIGNMENT SHEET #3 — DESIGN AND PREPARE A MESSAGE FOR A PRINTING PROCESS

NAME _____ SCORE _____

Directions: Design a message that can be reproduced using a printing process available to your class. The procedure for making a screen print is outlined in Job Sheet #1. However, your instructor may require you to reproduce your message using another printing method. Check with your instructor for the required procedure.

Suitable designs include safety posters, advertising flyers, stationery or business cards with logo you've designed for your company, T-shirt or cap illustrations, or greeting cards.

Your design will be evaluated in the following areas:

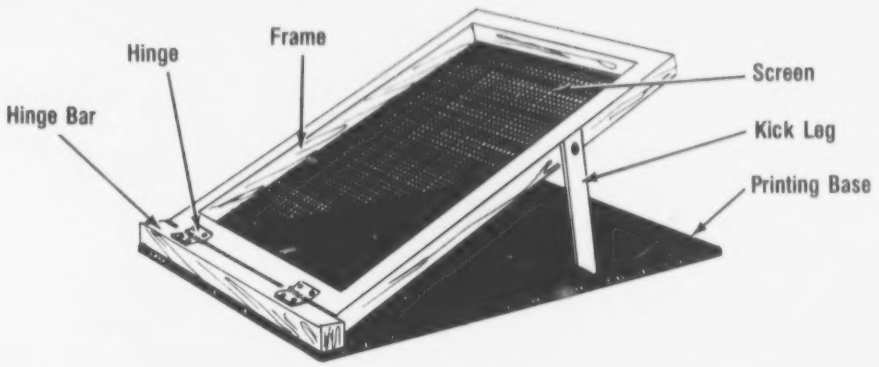
— Eye appeal	10 pts max
— Message content	10 pts max
— Originality	10 pts max
— Organization	10 pts max
— Interest	5 pts max
— Neatness	5 pts max
— Proper use of equipment	50 pts max
Total	100 pts max

GRAPHIC REPRODUCTION
UNIT V

JOB SHEET #1 — MAKE A SCREEN PRINT

A. Equipment and supplies

1. Frame, screen, and printing base



2. Squeegee or several pieces of stiff cardboard smaller than width of screen
3. Photo emulsion, mixed according to manufacturer's directions
4. Wooden block, slightly smaller than frame, covered with black felt or painted black
5. Original design on white paper
6. Clear, clean glass the size of screen or larger
7. 300-watt incandescent light
8. Sink with running water
9. Clean newsprint
10. Fan or hair dryer (optional)
11. Tape or block-out solution and brush
12. Screen printing ink
13. Paper stock for printing
14. Line and clips or rack for drying prints

JOB SHEET #1

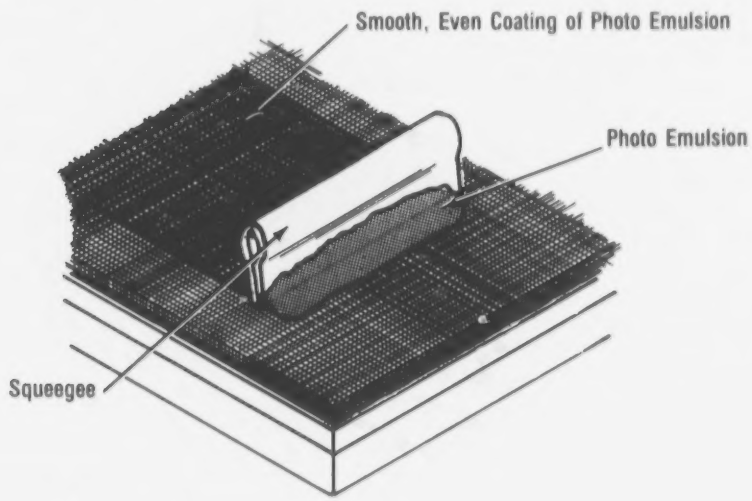
B. Procedure

1. Prepare screen.

   a. Spread emulsion with a squeegee in a smooth, even coat to cover screen completely. Allow to dry according to emulsion manufacturer's directions. (See Figure 1)

   (NOTE: Keep screen free of dust during drying time. If you prepare the screen the day before the actual printing, you must store the screen in a light-free cabinet or box.)

   FIGURE 1



   b. Wash squeegee.

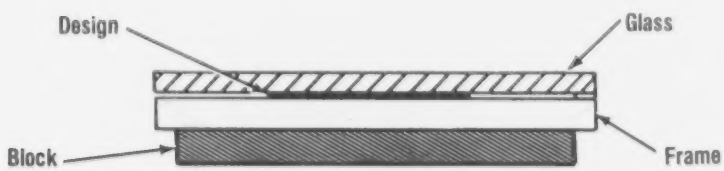
2. Position design.

   a. Place frame on felt-covered block **bottom side up.**

   b. Locate design on screen with the right-reading side of design in contact with screen.

   c. Position a piece of clean glass over design. (Figure 2)

   FIGURE 2



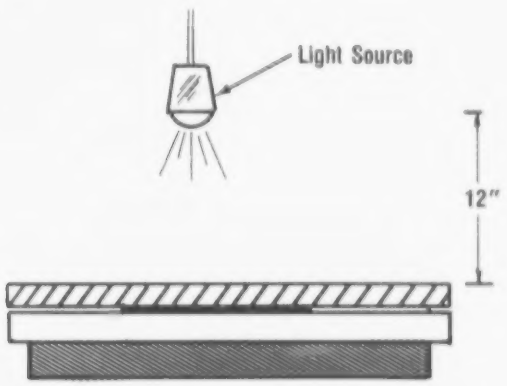
JOB SHEET #1

3. Expose screen.

   a. Place screen to be exposed in a dark room, closet, or cabinet.

   b. Position light source 12 inches above screen. (Figure 3)

   FIGURE 3



   c. Leave screen under light source for approximately nine minutes.

   (NOTE: Check with your instructor for the exact exposure time according to the emulsion used.)

4. Rinse and dry screen.

   a. Wash exposed screen in sink with cold or warm water. Rinse thoroughly on both sides of screen until image is completely developed.

   b. Remove excess water with clean newsprint.

   (NOTE: You may use a fan or hair dryer to speed drying time.)

5. Print design.

   a. Use block-out solution or tape to block out edges and any holes that may appear in the exposed screen.

   b. Place screen over printing base and secure.

   c. Distribute ink with squeegee or stiff cardboard across one end of screen.

   d. Clean squeegee.

   e. Align paper to be printed on printing base and secure.

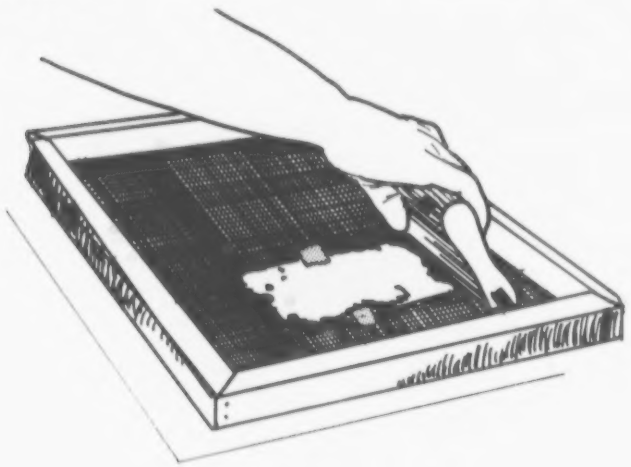
JOB SHEET #1

f. Lower frame over stock to be printed.

g. Tilt squeegee at a 30-degree angle to printing surface behind ribbon of ink.

h. Apply downward pressure and pull squeegee across screen only once. (Figure 4)

FIGURE 4



i. Raise frame and support it with kick leg.

j. Remove printed stock.

k. Hang stock on line, or place on rack to dry.

6. Clean screen as soon as possible after printing.

7. Follow instructor's directions for complete clean-up procedure.

GRAPHIC REPRODUCTION
UNIT VI

PRACTICAL TEST
JOB SHEET #1 — MAKE A SCREEN PRINT

STUDENT'S NAME _____ DATE _____

EVALUATOR'S NAME _____ ATTEMPT NO. _____

Instructions: When you are ready to perform this task, ask your instructor to observe the procedure and complete this form. All items listed under "Process Evaluation" must receive a "Yes" for you to receive an overall performance evaluation.

PROCESS EVALUATION

(EVALUATOR NOTE: Place a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. If the student is unable to achieve this competency, have the student review the materials and try again.)

The student:	YES	NO
1. Checked out proper equipment and materials.	_____	_____
2. Prepared screen.	_____	_____
3. Positioned design.	_____	_____
4. Exposed screen.	_____	_____
5. Rinsed and dried screen.	_____	_____
6. Printed design.	_____	_____
7. Cleaned screen when finished.	_____	_____
8. Checked in/put away equipment and materials.	_____	_____
9. Cleaned the work area.	_____	_____
10. Performed steps in a timely manner (___hrs. ___min. ___sec.)	_____	_____
11. Practiced safety rules throughout procedure.	_____	_____
12. Provided satisfactory responses to questions asked.	_____	_____

EVALUATOR'S COMMENTS: _____

_____

JOB SHEET #1 PRACTICAL TEST

PRODUCT EVALUATION

(EVALUATOR NOTE: Rate the student on the following criteria by circling the appropriate numbers. Each item must be rated at least a "3" for mastery to be demonstrated. (See performance evaluation key below.) If the student is unable to demonstrate mastery, student materials should be reviewed and another product must be submitted for evaluation.)

Criteria:				
	4	3	2	1
Correct amount of ink on design				
	4	3	2	1
No excess ink around design (edges properly masked)				
	4	3	2	1
Sharp lines on design				
	4	3	2	1
Appropriate design for screening used				

EVALUATOR'S COMMENTS: _____

_____

PERFORMANCE EVALUATION KEY
4 — Skilled — Can perform job with no additional training. 3 — Moderately skilled — Has performed job during training program; limited additional training may be required. 2 — Limited skill — Has performed job during training program; additional training is required to develop skill. 1 — Unskilled — Is familiar with process, but is unable to perform job.

(EVALUATOR NOTE: If an average score is needed to coincide with a competency profile, total the designated points in "Product Evaluation" and divide by the total number of criteria.)

GRAPHIC REPRODUCTION
UNIT V

NAME _____ SCORE _____

TEST

1. Match the terms on the right with the correct definitions.

_____a.	Type and artwork paste-up that is ready to be photographed in preparation for printing	1. Binding
_____b.	A multi-purpose press that prints from rolls of paper	2. Camera-ready copy
_____c.	A particular style of letters, numbers, and punctuation marks used in printing	3. Copyfitting
_____d.	The process of calculating the amount of copy that will fit into a certain amount of space	4. Electronic desktop publishing
_____e.	Artwork or type that contains only black and white tones (no gray tones)	5. Font
_____f.	Producing cold type using a photographic process	6. Image carrier
_____g.	The process of fastening together printed materials	7. Line work
_____h.	A large sheet of paper that has been folded several times and then cut to produce a series of pages	8. Photographs
_____i.	Press used to produce high-quality, single and multiple color printed material	9. Phototypesetting
_____j.	An object or material that carries the image during printing; receives ink to print on the desired surface	10. Sans serifs
_____k.	The small cross strokes that project out from the main letter strokes	11. Serifs
_____l.	Using a computer and appropriate software to layout, typeset, and print publications	12. Sheet fed press
		13. Signature
		14. Typeface
		15. Web press

TEST

2. Distinguish between the two basic types of graphic reproduction by placing a "C" by the descriptions of copying and a "P" by the descriptions of printing.

_____a. Used when larger quantities are needed

_____b. Specially prepared image carriers are made from the original material

_____c. One copy is made for each exposure

_____d. Mechanical presses are used for transferring ink or dye from image carrier to paper

_____e. Used when smaller quantities are needed

_____f. Original material is exposed to photosensitive material for reproduction

3. Complete the following statements concerning the common methods of copying by selecting the best answers.

_____a. Specially coated paper is used in the _____ process.

1) Blueprinting
2) Xerography
3) Diazo
4) 1 and 3
5) 2 and 3

_____b. The finished copy is blue with white lines in the _____ process.

1) Blueprinting
2) Xerography
3) Diazo
4) 1 and 3
5) 2 and 3

_____c. _____ is a dry process of reproduction. (No water is needed.)

1) Blueprinting
2) Xerography
3) Diazo
4) 1 and 3
5) 2 and 3

TEST

4. Match the major printing processes on the right with the correct descriptions.

_____a.	The process of printing from a flat surface with the image and nonimage areas kept separated by chemistry. So named because the image is first received by a blanket and is then transferred to the sheet to be printed.	1. Relief printing (letterpress)
_____b.	Printing by forcing ink through a stencil coming in contact with copy paper. The stencil is a sheet of porous tissue coated with a special ink-repelling wax.	2. Gravure printing (intaglio)
_____c.	Printing directly from raised letters, inked and pressed against paper surface	3. Screen printing
_____d.	A printing process where the recessed image area is made by engraving, etching, or scratching	4. Offset printing (lithography)
_____e.	Printing directly from a stencil through a finely woven, cloth or wire mesh screen	5. Spirit duplicating
_____f.	Uses a chemical fluid coming in contact with copy paper that is pressed against a master sheet containing soluble dye	6. Mimeograph duplicating

5. Arrange in order the stages in the printing process by placing the correct sequence numbers (1-4) in the appropriate blanks.

_____a. Printing image carrier is inked.

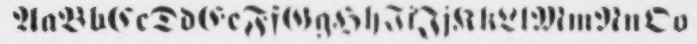
_____b. Inked image is transferred onto selected material (paper, etc.)

_____c. Printing image carrier is made from original image.

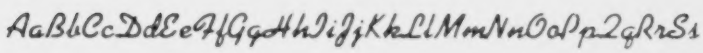
_____d. Original image (camera-ready copy) is developed.

TEST

6. Identify the following styles of type by selecting the correct name from the list on the right.



a. _____



b. _____

AaBbCcDdEeFfGgHhIiJjKkLlMmNnOo

c. _____

Traditional Roman
Text
Special
Script
Oldstyle Roman
Gothic
Square Serif
Modern Roman

7. Match variations of type on the right with the correct illustrations.

_____a. ***Avant Garde***
Avant Garde

_____b. Avant Garde
Avant Garde

_____c. Avant Garde
Avant Garde
Avant Garde

1. Different weights
2. Different widths
3. Italics

8. Complete the following statements concerning the units for measuring type by circling the correct words.

a. The smallest unit of measurement is the (**point, pica**).

b. Points are used to measure (**type body size, line lengths**).

c. 1 pica = (**½, 2, 12**) points.

d. 6 picas = 1 (**point, inch**).

TEST

9. Distinguish between hot and cold type composition by placing an "H" or "C" next to the correct characteristics.

   _____a. Three-dimensional type

   _____b. An example is Ludlow type.

   _____c. Two-dimensional type

   _____d. An example is clip art.

10. Select true statements concerning graphics laboratory safety rules by placing an "X" next to the true statements.

    _____a. Safety glasses are not needed.

    _____b. Use unlabeled products only if you know what is in the bottle.

    _____c. Remove all jewelry, ties, scarves, and loose clothing before using equipment.

    _____d. Wear protective gloves when handling chemicals.

    _____e. Do not stop a machine before reaching in near the moving parts because stopping it will waste time.

    _____f. You may leave equipment running when you leave if you are only going to be gone for a short time.

(NOTE: If the following activities have not been accomplished prior to the test, ask your instructor when they should be completed.)

11. Identify type styles in printed material. (Assignment Sheet #1)

12. Design and reproduce a message using a copying process. (Assignment Sheet #2)

13. Design and prepare a message for a printing process. (Assignment Sheet #3)

14. Demonstrate the ability to make a screen print. (Job Sheet #1)

GRAPHIC REPRODUCTION
UNIT V

ANSWERS TO TEST

1. a. 2
   b. 15
   c. 14
   d. 3
   e. 7
   f. 9
   g. 1
   h. 13
   i. 12
   j. 6
   k. 11
   l. 4

2. a. P
   b. P
   c. C
   d. P
   e. C
   f. C

3. a. 4
   b. 1
   c. 5

4. a. 4
   b. 6
   c. 1
   d. 2
   e. 3
   f. 5

5. a. 3
   b. 4
   c. 2
   d. 1

6. a. Text
   b. Script
   c. Gothic

7. a. 3
   b. 2
   c. 1

8. a. Point
   b. Type body size
   c. 12
   d. Inch

9. a. H
   b. H
   c. C
   d. C

10. c, d

ANSWERS TO TEST

11.-13. Evaluated to the satisfaction of the instructor

14. Performance skills evaluated to the satisfaction of the instructor

PHOTOGRAPHY
UNIT VI

UNIT OBJECTIVE

After completion of this unit, the student should be able to use the photography process to produce a black and white print. Competencies will be demonstrated by completing the assignment sheet, job sheets, and the unit tests with a minimum score of 85 percent.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Match terms related to photography with the correct definitions.
2. Match basic parts of a camera with the correct descriptions.
3. Complete statements on how a camera works.
4. Match basic types of cameras with the correct descriptions.
5. Distinguish between the common types of camera lenses.
6. Select true statements on how to care for a camera.
7. Distinguish between types of light meters.
8. List three basic types of film.
9. Match modes of film with the correct descriptions.
10. Select true statements on how to take photographs.
11. Arrange in order the four main steps in producing a photograph.

OBJECTIVE SHEET

12. Identify types of film processing equipment and materials.

13. Match chemicals used in developing black and white film with their correct functions.

14. Select true statements concerning general lab rules.

15. Identify good characteristics of a photograph. (Assignment Sheet #1)

16. Demonstrate the ability to:

    a. Take a series of black and white pictures. (Job Sheet #1)

    b. Process black and white film. (Job Sheet #2)

    c. Print a picture. (Job Sheet #3)

PHOTOGRAPHY
UNIT VI

SUGGESTED ACTIVITIES

A. Obtain additional materials and/or invite resource people to class to supplement/reinforce information provided in this unit of instruction.

(NOTE: This activity should be completed prior to the teaching of this unit.)

B. Provide students with objective sheet.

C. Discuss unit and specific objectives.

D. Provide students with information and assignment sheets.

E. Discuss information and assignment sheets.

F. Provide students with job sheets.

G. Discuss and demonstrate the procedures outlined in the job sheets.

H. Integrate the following activities throughout the teaching of this unit:

1. Demonstrate the simplicity of cameras by having the students construct a pin hole camera and expose film.

2. Show examples of various types of cameras, lenses, exposure meters, and the modes of film.

3. Demonstrate how each mode of film is loaded into the camera.

4. Have a professional photographer visit the class to discuss the principles of good photography and what makes an interesting photograph.

5. Use an instant camera to demonstrate good and poor photography techniques. Critique with class.

6. Discuss what happens when an exposure is made.

7. Discuss safe darkroom practices and chemical safety and storage.

8. Have the class, as a group or individually, plan a darkroom in order to familiarize them with the equipment to be used in the laboratory. Prepare or provide a poster for students to follow showing the proper darkroom set up, including the order in which chemicals are used.

9. Discuss how and why step-off test prints are made.

10. Have the students make a contact print of their negatives.

SUGGESTED ACTIVITIES

11. Discuss print improvement using cropping, burning, and dodging.

12. Demonstrate how to load a reel and have students practice the loading procedure before using exposed film.

13. Discuss f-stop settings if your students plan to use a 35mm camera.

14. Advise students that film processing information and development time chart are included in each box of film.

15. Obtain film development and processing information from Kodak. Contact:

    Kodak Consumer Information Marketing
    1-800-242-2424

16. Have students practice using the black bag technique when loading film.

17. Have students set up a portrait studio in the classroom, and take black and white portraits as a fund raising activity for their student organization. Film should be developed and processed as 5" × 7" or 8" × 10" enlargements. If color film is used, the developing process will need to be done by a film processing company.

18. Meet individually with students to evaluate their progress through this unit of instruction, and indicate to them possible areas for improvement.

I. Administer test.

J. Evaluate test.

K. Reteach if necessary.

REFERENCES USED IN DEVELOPING THIS UNIT

A. Walker, John R. *Graphic Arts Fundamentals.* South Holland, IL: The Goodheart-Willcox Co., Inc., 1980.

B. Jones, Ronald E. and Janet L. Robb. *Discovering Technology Communication.* Dallas TX: Harcourt Brace Jovanovich, Publishers, 1986.

C. Walker, Richard J. and Robert E. Walker. *Exploring Photography.* South Holland, IL: The Goodheart-Willcox Co., Inc., 1983.

SUGGESTED SUPPLEMENTAL RESOURCES

A. Texts

1. Rhode, Robert B. and Floyd H. McCall. *Introduction to Photography*. 4th ed. New York: Macmillan Publishing Co., Inc., 1981.

2. Laycock, George. *The Complete Beginner's Guide to Photography*. Garden City, NY: Doubleday & Company, Inc., 1979.

3. Pinkard, Bruce. *The Photographer's Bible: An Encyclopedic Reference Manual*. NY: Arco Publishing, Inc., 1983.

4. *How to Take Good Pictures*. Eastman Kodak Company. NY: Ballantine Books/Random House, Inc., 1981.

B. Video Tape

Photographic Processing (Available in VHS and Beta)
Photographic and motion picture processing laboratories are the subject of this video program. Such operations as color timers, printer operators, film mounters, copy cameramen, and developing machine operators are examined. Also included, discussion of optical sound transfer in context with the overall working environment. Internal training programs and the unique working conditions are introduced. To order, specify program No. CS-162.

Morris Video
413 Avenue G #1
P.O. Box 443
Redondo Beach, CA 90277
1-800-843-3606

PHOTOGRAPHY
UNIT VI

INFORMATION SHEET

I. **Terms and definitions**

A. ASA number — A film rating number that identifies a film's sensitivity to light; is used to program the camera's metering system

(NOTE: ASA numbers are being replaced by ISO numbers.)

B. Contact print — A print made by exposing photographic paper while it is in contact with one or more negatives

C. Depth of field — The range of distance in which everything appears in sharp focus

D. Enlargement — A photographic print that is larger than its negative

E. Film speed — A term used to identify a film's sensitivity to light

F. Focal length — The distance in millimeters from the aperture to the film plane when the film is focused to infinity

G. F-stop — Numbers which identify the aperture sizes of a camera lens

(NOTE: The larger the f-stop number, the smaller the aperture.)

H. ISO (International Standards Organization) number — A film rating number that indicates a film's sensitivity to light; used to program the camera's metering system

I. Panning — Moving the camera to follow a subject that is also moving

Examples: Auto races, sports events, running animals

J. Safelight — Special darkroom light that will not expose film

(NOTE: They are usually red or amber colored.)

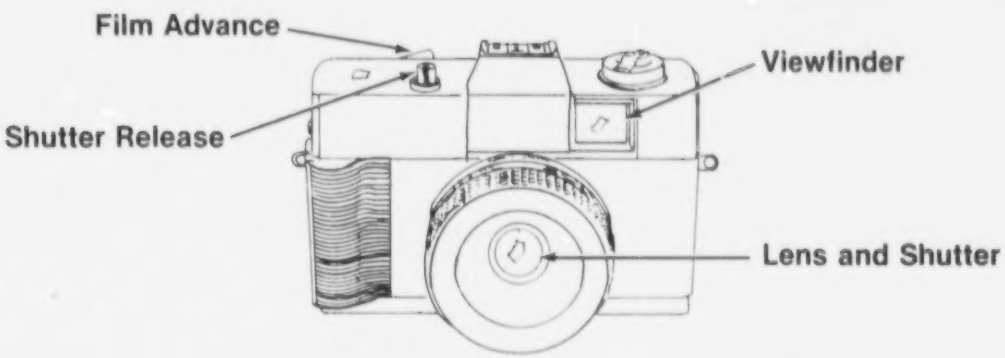
K. Shutter speed — Length of time that light strikes the film

(NOTE: Some inexpensive cameras have only one shutter speed. Better cameras usually have a range of shutter speeds ranging from 1 second to $^1/_{1000}$ of a second. Even though the shutter speeds appear on the camera as whole numbers such as 8, 15, 30, 60, 125, and so on, these numbers represent fractions of a second, such as $^1/_8$, $^1/_{15}$, $^1/_{30}$, $^1/_{60}$, $^1/_{125}$, and so on.)

L. Step-off test print — The best way to determine which enlarger exposure time makes the best print

INFORMATION SHEET

II. **Basic parts of a camera**



A. Viewfinder — The eyepiece that the photographer looks through to compose the picture to be taken

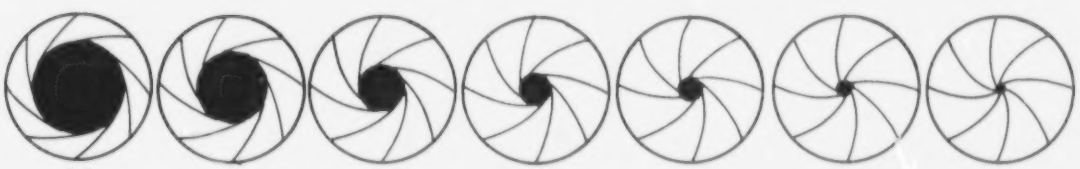
B. Lens — Plastic or glass device that directs (**focuses**) light rays on the film

C. Shutter — Controls the length of **time** that light may enter the camera lens and strike the film

(NOTE: The shutter is operated by the shutter release button which opens and closes the shutter with controlled time limits.)

D. Aperture — The opening (hole) in the lens that controls the **amount** of light entering the camera

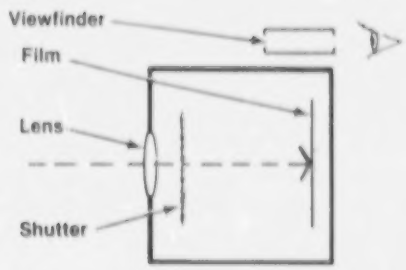
(NOTE: This may be adjusted on some cameras to allow more or less light into the camera. On cameras that may be adjusted,the size of the aperture opening is indicated with an f-stop number. The largest numbers admit the least light to the film.)



(NOTE: Adjacent f-stops either halve or double the light source.)

INFORMATION SHEET

III. How a camera works



(NOTE: The simplest form of camera is sometimes referred to as a "box" camera.)

A. A camera is basically a light box with one end holding the film and the other end having a small hole which can be briefly opened.

B. When the hole is uncovered, light reflected off any object in front of the box travels through the hole and strikes the film.

C. A lens is located in front of the opening in the box to gather and concentrate light onto the film.

D. The shutter controls the amount of time the light is allowed to act on the film.

E. The viewfinder shows what part of the scene will be in the photograph.

IV. Basic types of cameras

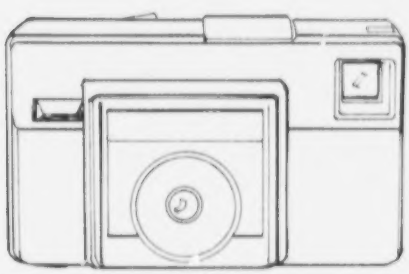
A. Small format cameras with fixed features

1. Are designed for casual snapshots.

2. Usually have fixed focus, fixed shutter speed, and fixed (not interchangeable) lenses.

3. Negatives are usually too small for professional work.

Examples: Kodak Instamatic and Pocket cameras



INFORMATION SHEET

B. Single-lens reflex cameras (SLRs)

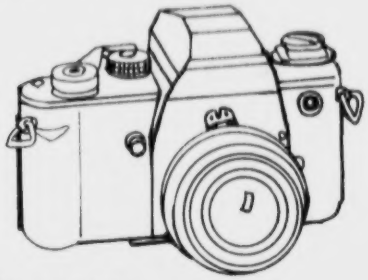
1. Are designed for more serious amateurs and photojournalists.

2. Usually have adjustable features such as interchangeable lenses and adjustable shutter speeds.

   (NOTE: Electronic components are being used more as optional features such as automatic shutters, autofocus, and autowinding.)

3. Focusing is accomplished directly through the camera's lens.

4. Most SLRs use 35 mm film.



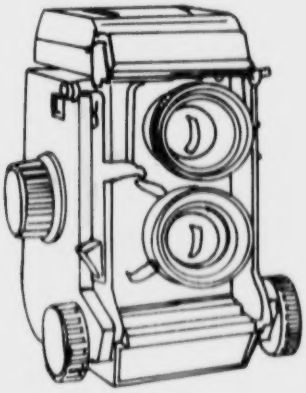
C. Twin-lens reflex cameras

1. Have two lenses with the top lens used for focusing and viewing and the bottom lens used for projecting image onto film.

2. With a twin-lens camera, there is a difference between what is seen through the viewfinder and what is recorded on film. This is referred to as parallax.

3. This type of camera produces medium-size negatives (2 1/4" x 2 1/4") which may be used for producing higher-quality prints.

   (NOTE: Very few of these are being made any more as this camera is bulkier and not as versatile as the 35mm SLR.)



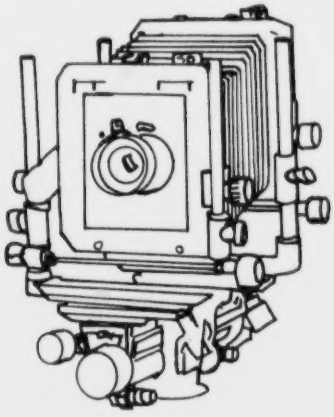
INFORMATION SHEET

D. Large format cameras

1. Are designed for studio, advertising, and some newspaper photography.

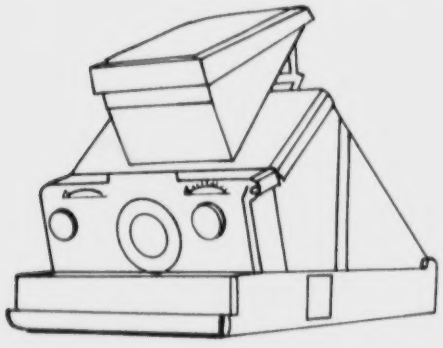
2. Produce large negatives (usually 4" × 5") for high-quality prints.

3. Photographer has more control of image because of the tilts possible with the camera. (Accordion area [bellows] of camera can be moved into many positions.)



4. These cameras are usually mounted on a tripod because of their weight.

E. Instant picture cameras — Take and develop a picture in a minute or less.



INFORMATION SHEET

V. Common types of camera lenses

A. Normal lens

1. Sees image size and distance relationships about the same as the human eye.
2. Designed for general picture-taking such as outdoor scenes, people, pets, and social events.

(NOTE: This is the main lens and usually is the only lens needed by beginners.)

B. Wide-angle lens

1. Sees more of the scene than a normal lens.
2. Subject appears smaller on the print.
3. Designed for showing maximum subject matter in the frame such as inside buildings, outdoor scenes, and large group shots.

C. Telephoto lens

1. Makes the subject matter look bigger than it is.
2. Allows the photographer to zero in on one part of a scene and bring it closer.
3. Designed for photographing sporting events, wildlife pictures, and distance shots.

D. Zoom lens

1. Is adjustable for a wide variety of distances.
2. Designed to replace the many lenses that a professional photographer needs because it can do the jobs of many lenses.

(NOTE: Quality zoom lenses are very expensive and require great skill for proper operation. Therefore, these are primarily used by professional photographers.)

VI. How to care for a camera

(NOTE: Professional cameras are expensive, complicated, and very delicate. Even minor problems can be costly to repair.)

A. Store and carry the camera in its protective case to protect it from bumps.

B. Keep the camera away from moisture and temperature extremes (too hot or too cold places).

Examples: Attics, basements, car glove compartments

INFORMATION SHEET

C. Use the lens cap when the camera is not in use to protect the lens from dirt and dust.

D. Remove dust on a camera lens by gently blowing it or brushing it with a special lens brush.

E. Remove fingerprints or smears using lens-cleaning tissue. (Not eyeglass tissue!) Lens-cleaning fluids are only recommended for occasional use.

F. Remove dust from the inside of the camera when visible using lens-cleaning tissue and brush.

G. Never disassemble your camera or its lens. This work must only be done by trained specialists.

H. Check the camera's operation before loading with film.

I. Do not advance the film until you are ready to take a picture. Do not store a camera with the shutter cocked.

J. Never attempt to oil or lubricate any part of a camera.

K. Remove the batteries from a camera if it is to be stored for any length of time.

L. Read your camera's manual for proper use and special care instructions.

VII. Types of light (exposure) meters (Transparency 1)

(NOTE: Light meters can be either hand-held or built into the camera. Their readings will give you the information needed to set the aperture/shutter speed combination needed for a properly exposed picture.)

A. Reflected light meter — Measures the light reflected from the subject to the meter. The reflected light meter is pointed at the subject to be photographed.

(NOTE: This is the most common type of light meter.)

B. Incident light meter — Reads the light falling on the subject. The incident light meter should be used near the subject, not at the camera position unless lighting on both subject and camera is the same.

VIII. Basic types of film

A. Black and white

B. Color

C. Color slides

INFORMATION SHEET

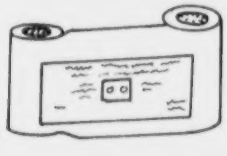
IX. Modes of film

A. Roll film — Most common type of film; contained in a light-tight canister called a magazine.

B. Reloadable cartridge — Can be reloaded with unexposed film after each use; this enables the photographer to control the number of shots by loading only the amount of film to be used.

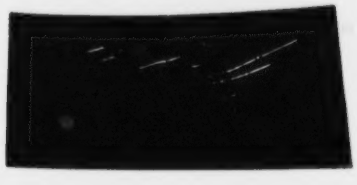
(NOTE: Film can be ordered in 50 feet and 100 feet rolls thus saving a photographer as much as 50% on film cost.)

C. Cartridge film — Comes in a plastic container that is loaded into camera; usually for 110 or 126 instamatic cameras.



D. Sheet film — Used for large format cameras and enlarging.

(NOTE: This film is also referred to as *cut film*.)



INFORMATION SHEET

X. How to take photographs

A. Hold the camera steady to prevent blurred pictures.

B. Keep obstructions away from the lens such as your fingers or the camera strap.

C. Hold the camera level.

D. Smoothly press the shutter release; don't jab it. Punching the button will move the camera and result in blurred pictures.

E. Set the film speed, shutter speed, and aperture as required for correct exposures.

(NOTE: Many of these are pre-set by the manufacturer. Check your camera's manual and film instructions for adjustable cameras.)

F. Determine direction of light striking subject.

Examples: Back lighting, side lighting, flat lighting

G. Focus the camera for sharp pictures.

(NOTE: Depending on your camera, this may be done manually by the photographer or electronically by the camera's internal components. On a fixed focus camera, the photographer must operate within certain distances for clear pictures.)

H. Use a flash as directed in your camera's manual.

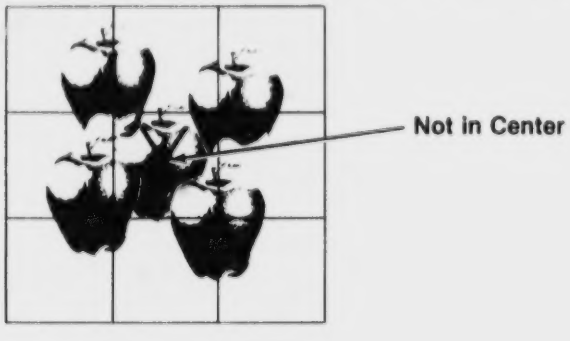
I. Center your eye in the viewfinder to compose your picture.

J. For good composition

1. Keep the background and foreground uncluttered so subject stands out clearly.

2. Move close enough to your subject so that only the important elements are in the picture.

3. Set your subject slightly off-center. This makes a more interesting picture than one where the subject is in the very center of the picture.



INFORMATION SHEET

4. Candid shots should look candid, not posed. Keep the subject busy.

5. Strive for balance in a shot. This may be formal or informal.

6. Avoid mergers such as when lines in the background interfere with the subject or important parts of the subject are cut out of the picture.

XI. Steps in producing a photograph

A. Take the picture.

1. Select camera and film.

2. Load film and make appropriate camera adjustments.

3. Compose and take the picture.

B. Prepare the film for processing.

1. Carefully unload camera in a dark area.

2. Load the film into the developing tank.

(CAUTION: This must be done in complete darkness. If light is allowed to reach the film at any time before it is developed, it will be ruined.)

C. Process the film.

(NOTE: The products of film processing are negatives which will be used to make photographic prints. To get high-quality negatives you must not only perform all steps in correct order, you also need to control time, temperature, and agitation.)

(CAUTION: Processing chemicals are potentially dangerous. Follow all safety rules for handling chemicals.)

1. Add chemicals (developer, stop bath, fixer, and wetting agent) and determine processing time.

(NOTE: One chemical is removed from the developing tank before another one is added. Your instructor will provide you with the necessary information.)

2. Remove film from developing tank and hang to dry.

D. Make a photographic print. The final product of black and white photography is a print.

(NOTE: Print development is done in a photography darkroom using a safe light.)

1. Use an enlarger to expose the print paper.

2. Process the paper to reveal and stabilize the image.

INFORMATION SHEET

XII. Types of film processing equipment and materials

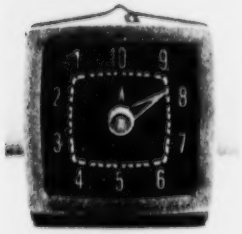
A. Scissors

B. Opener

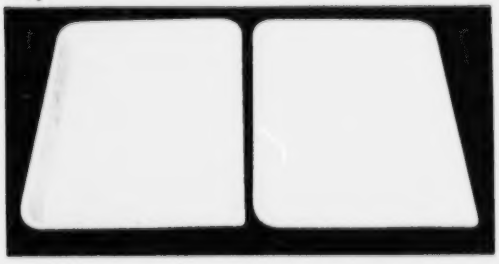
C. Thermometer

D. Developing tank

E. Timer



F. Trays



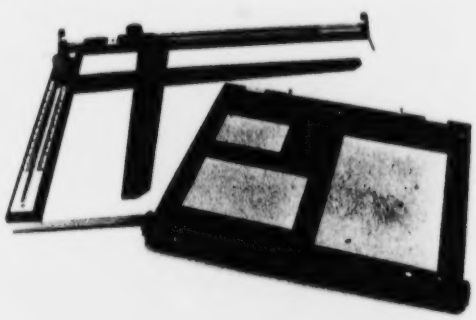
INFORMATION SHEET

G. Chemicals

H. Print paper

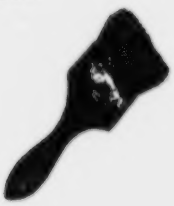
I. Negative carrier

J. Easel



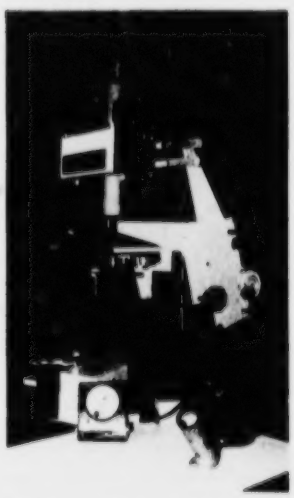
INFORMATION SHEET

K. Brush

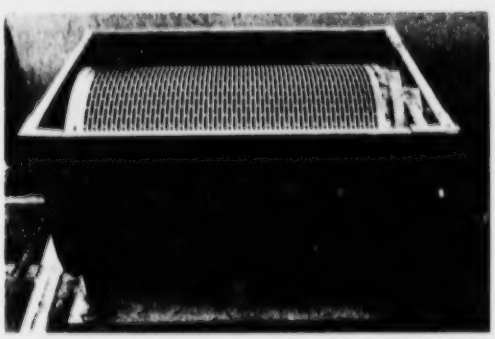


L. Tongs

M. Enlarger



N. Print washer



INFORMATION SHEET

XIII. Chemicals used in developing black and white film

(NOTE: The ideal temperature for developing chemicals is 68 degrees Fahrenheit [68°F].)

A. Developer — Chemical that causes exposed film to form a visible image

B. Stop bath — Acidic chemical that stops and neutralizes the developing process

C. Fixer (hypo) — Acidic chemical that dissolves undeveloped crystal on film and stabilizes film emulsion

D. Fixer neutralizer (hypo cleaning agent) — Chemical that rapidly removes fixer from photographic emulsion and greatly reduces wash time for film and paper

E. Wetting agent — Chemical used after the washing process to aid even drying

XIV. General lab rules

A. Wear old clothing or an apron when working in the lab.

B. Never take food or drinks into the lab.

C. Put all your trash in the trash basket.

Examples: Film spools, metal cans, boxes, paper

D. Use the tongs in the print sink to handle your prints. Do NOT put your hands in the chemicals.

E. If you get your hands wet, keep them off the walls, equipment, etc. until they are dry.

F. Handle all school equipment with great care. DO NOT try to "FIX" any equipment if it does not work properly. When school equipment is out of order, bring it to the attention of the instructor.

G. Clean and/or dry all tanks, reels, funnels, etc. and put them in their proper place when finished with them.

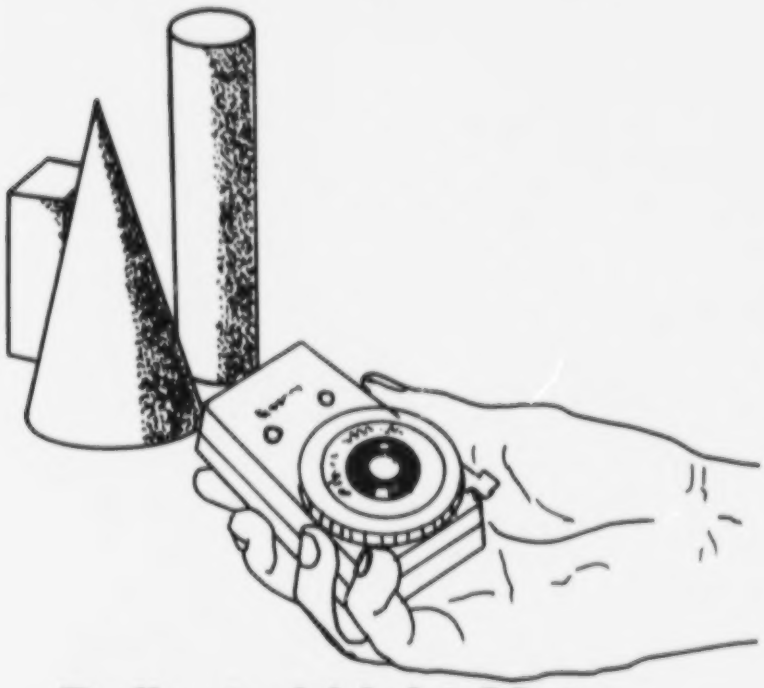
H. Put all of your bad prints or test strips in the trash. Do not leave pictures you do not want in the chemical tray or washer. Any prints left in the trays, washer, or sink at the end of the day will be put in the trash basket.

I. Do not bring wet HYPO prints out for viewing in the white light unless they are in a viewing tray.

J. Do not place anything wet in the enlarger booth, such as wet prints, equipment, etc.

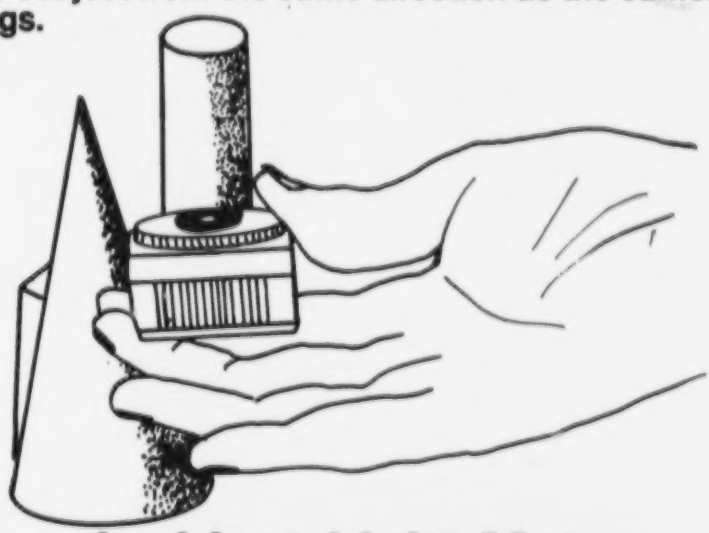
K. At the end of the lab period all enlarger booths and film processing area shall be cleared of all student materials and put in order for the next lab class.

Types of Light Meters



Reflected Light Meter

Point at the subject from the same direction as the camera for accurate readings.



Incident Light Meter

Hold near the subject and point either at the camera or light source for accurate readings.

PHOTOGRAPHY
UNIT VI

HANDOUT #1 — FILM DEVELOPING TIME CHART

Film	Developer	68°	70°	72°	75°
Kodak Tri-X	D-76	8	7 1/2	6 3/4	6
	D-76 (1:1)	10	9 1/4	8 1/2	7 1/2
	Microdol-X	10	9 1/4	8 1/2	7 1/2
Kodak Plus-X	D-76	5 1/2	5 1/4	4 3/4	4 1/4
	D-76 (1:1)	7 1/2	6 3/4	6 1/4	5 1/2
	Microdol-X	7 1/2	6 3/4	6 1/4	5 1/2
Kodak Panatomic-X	D-76	5	4 1/2	4 1/4	3 1/2
	D-76(1:1)	7	6 1/2	6	5 1/4
	Microdol-X	7	6 1/2	6	5 1/4
Kodak Verachrome	D-76	5 1/2	5 1/4	4 3/4	4 1/4
	D-76 (1:1)	7 1/2	6 3/4	6 1/4	5 1/2
	Microdol-X	7 1/2	6 3/4	6 1/4	5 1/2
Ilford HP5	D-76	7	6 1/2	6	5 1/4
	D-76 (1:1)	12	11	10	8 3/4
	Microdol-X	16 1/2	15	13 1/2	11

PHOTOGRAPHY
UNIT VI

HANDOUT #2 — DAYLIGHT EXPOSURE TABLE (FOR KODAK TRI-X FILM AT ASA 400)

Basic Shutter Speed: 1/500 second.

Subject Matter	Lighting Conditions				
	Bright Sun	Hazy Sun	Cloudy Bright	Cloudy Dull or Open Shade	Deep Shade
Light	f/22	f/16	f/11	f/8	f/5.6
Medium	f/16	f/11	f/8	f/5.6	f/4
Dark	f/11	f/8	f/5.6	f/4	f/2.8

Light Subjects — Distant scenery, nearby people in marine, beach, or snow scenes. Light colored objects predominating.

Medium Subjects — Nearby people, gardens, houses, scenes not in shade. Light and dark objects in equal proportion.

Dark Subjects — People in dark clothing, dark foliage, flowers, animals and buildings (except some stone or light painted).

To use above chart with other films make the following adjustment in the basic exposure:

Plus-X film — Increase exposure one stop (i.e. f/22 to f/16).

Verachrome film — Increase exposure one stop.

Panatomic-X film — Increase exposure three stops.

Ilford HP5 — Use same exposure as Tri-X.

PHOTOGRAPHY
UNIT VI

ASSIGNMENT SHEET #1 — IDENTIFY GOOD CHARACTERISTICS OF A PHOTOGRAPH

NAME _____ SCORE _____

Directions: Select what you think is a good photograph. List the good characteristics below. Discuss with the class why it is good. One of the following may be a good source for the photograph.

1. Newspapers
2. Family albums
3. School yearbook
4. Magazines

You will be evaluated according to the following:

1. The subject is well defined and uncluttered.
2. The composition was well spaced.
3. The correct light angles were used well.
4. The picture has good balance.
5. The picture was an original.

PHOTOGRAPHY
UNIT VI

JOB SHEET #1 — TAKE A SERIES OF BLACK AND WHITE PICTURES

A. Equipment and materials

1. Camera loaded with black and white film
2. Light source (artificial or natural)
3. Tripod or other support object for camera

(NOTE: Plan to have your series tell a story. Subject suggestions: Motion, time, technology, communication, or science.)

B. Procedure

(NOTE: Follow instructor's directions for camera settings.)

1. Select subject. Refer to handouts for guidelines.
2. Put light source behind you and toward subject.
3. Set shutter speed if necessary.
4. Focus camera if necessary.

(NOTE: You may want to focus on only one part of the picture, depending on the desired effect. This procedure is called **selective focusing.**)

5. Support camera on stationary object, or hold camera in both hands.
6. Frame subject.
7. Check framed area for mergers.
8. Take picture.
   a. Depress shutter release smoothly.
   b. Pan camera for moving object.
9. Advance film when ready to take another picture.
10. Complete film exposure.
11. Remove film from camera as directed by your instructor.

JOB SHEET #1

12. Label film with your name and class hour.

    (NOTE: Check with instructor for directions for processing. DO NOT shoot another roll of film until you have processed the exposed film and studied the results with your instructor.)

13. Store camera according to instructor's directions.

PHOTOGRAPHY
UNIT VI

JOB SHEET #2 — PROCESS BLACK AND WHITE FILM

A. Equipment and materials

1. Darkroom or light-tight closet
2. Developing tank and reel
3. Sink with hot and cold water source
4. Developing chemicals (developer, stop bath, fixer, washing aid, wetting agent)
5. Photo thermometer
6. Bottle opener
7. Scissors
8. Minute timer
9. Squeegee
10. Line and two clips for drying film

B. Procedure

(NOTE: In addition to the information here you must know the specific processing times for the various developing chemicals.)

1. Arrange film, developing tank and reel, scissors, and bottle opener in darkroom.
2. Close door of darkroom and turn off light.

   (NOTE: Door may be opened only after film is on reel and securely inside developing tank.)

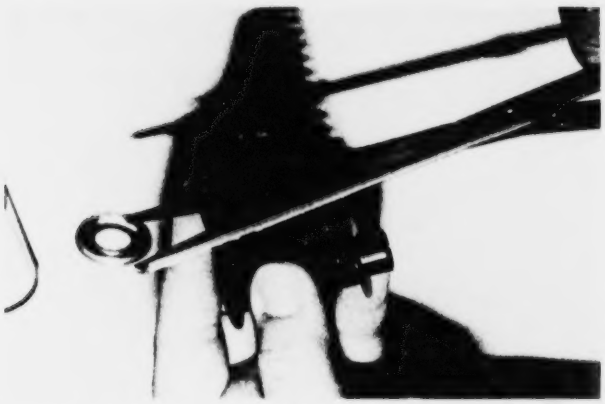
3. Open film canister with bottle opener. (Figure 1)

FIGURE 1

JOB SHEET #2

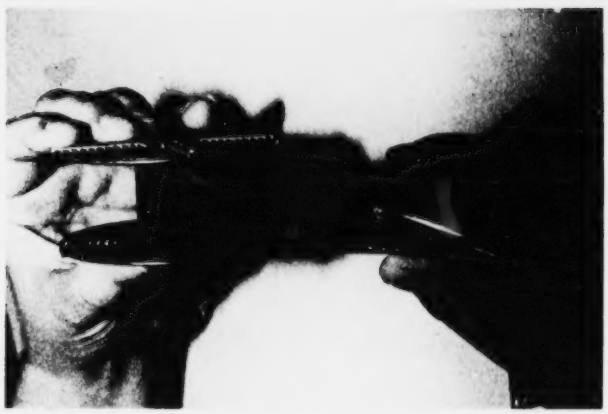
4. Trim end of film with scissors. (Figure 2)

FIGURE 2



5. Wind film onto reel. (Figure 3)

FIGURE 3



6. Place reel in developing tank.

7. Close tank.

JOB SHEET #2

8. Prepare chemicals and determine processing time.

   (NOTE: The instructor will supply you with this information.)

9. Fill the developing tank with developer and immediately start the timer. Rap the tank to dislodge air bubbles, and agitate the tank for 30 seconds. Then agitate for 5 seconds every 30 seconds for the rest of the developing time. Drain the tank during the last few seconds of the step.

   (NOTE: Agitate the developing tank by tilting it back and forth while moving it in a figure-eight motion. See Figure 4.)

   FIGURE 4

10. Pour in the stop bath. Agitate in the same manner as for the developer. When the step is complete, pour the stop bath back into its container.

11. Pour in the fixer and agitate. Continue fixing for twice the clearing time determined earlier. Then pour the fixer back into its container.

12. Remove the developing tank lid and wash the film under running water. The wash time is based on the particular washing aid you are using. Your instructor or the manufacturer's instructions will identify the amount of time for this and the following two steps.

13. Drain the water from the tank and pour in the washing aid. Agitate the tank for the recommended amount of time. Then pour the washing aid back into its container.

14. Wash the film under running water for the recommended time. Then pour the remaining water out of the tank.

15. Pour in the wetting agent. Gently agitate. After the recommended soaking time, pour the wetting agent back into its container.

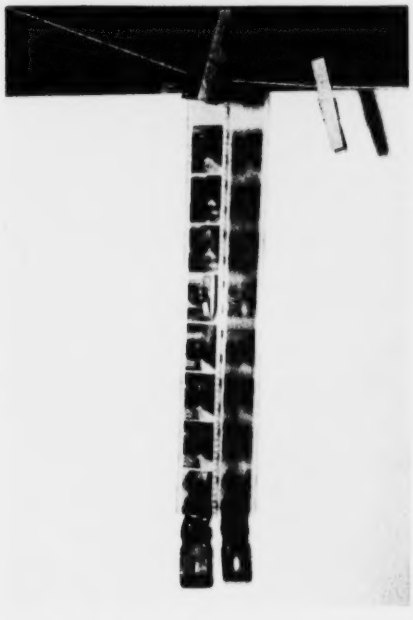
JOB SHEET #2

16. Remove the film from the reel. (Figure 5)

FIGURE 5

17. Hang it to dry in a dust-free place. Attach a clip, such as a wooden clothespin, to the bottom of the film. The clip will keep the film from curling as it dries. (Figure 6)

FIGURE 6



18. Wash the developing tank and other equipment. Place the equipment where it will drain and dry. Close all the lids on the chemical containers and clean up the area.

PHOTOGRAPHY
UNIT VI

JOB SHEET #3 — PRINT A PICTURE

A. Equipment and materials

1. Enlarger in darkroom with safelight
2. Developed film
3. Negative carrier
4. Soft brush for dust removal
5. Enlarger timer
6. Chemicals (developer, stop bath, and fixer) in trays
7. Tongs
8. Focusing aid (optional)
9. Easel
10. Print paper
11. Squeegee
12. Plain white paper
13. Print washer or deep tray

B. Procedure

(NOTE: Your instructor may direct you to make a step-off test print or a contact print at this time and will supply you with the appropriate information.)

1. Select negative to be developed.

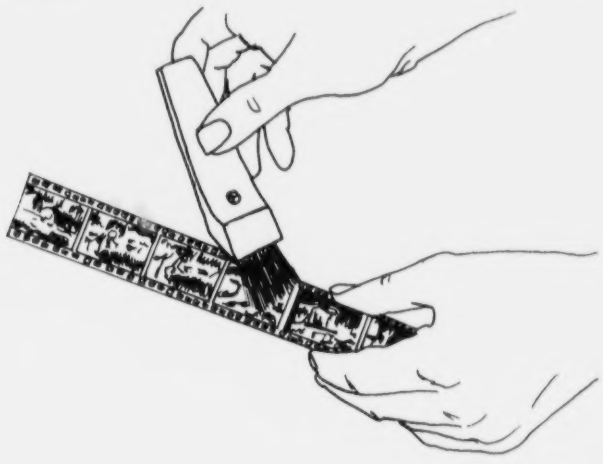
   (NOTE: A roll of developed film should be cut into lengths of five to six negatives each.)

JOB SHEET #3

2. Enlarge negative.

   a. Remove dust particles from negative carrier and negative using a soft brush. (Figure 1)

      FIGURE 1



   b. Place negative in negative carrier, emulsion (dull) side down.

   c. Lay a piece of plain white paper in easel.

   d. Place easel on base of enlarger.

   e. Turn off darkroom light and turn on SAFELIGHT.

   f. Turn on enlarger light source.

   g. Raise or lower enlarger head until image is desired size.

      (NOTE: The lens of the enlarger should be wide open.)

   h. Focus lens until image has maximum sharpness.

      (NOTE: Use focusing aid if needed.)

   i. Switch off enlarger light source.

   j. Replace plain paper with print paper.

      (NOTE: Print paper should be stored in paper safe. Exposure time will differ according to paper type. Check with instructor for exposure time.)

   k. Turn on enlarger light source.

   l. Set enlarger timer and expose print for recommended time.

   m. Turn off enlarger light source.

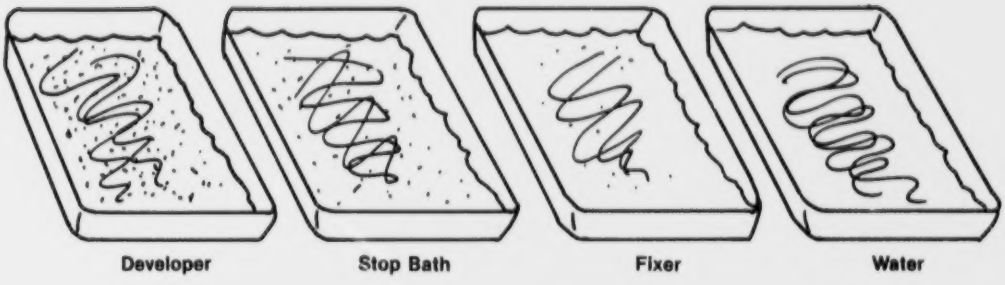
JOB SHEET #3

3. Develop print paper.

   a. Have four trays ready — three developing trays containing developer, stop bath, and fixer and a washing tray. (Figure 2)

      (CAUTION: Each tray needs tongs. DO NOT interchange tongs and trays. Each chemical can be contaminated by the other.)

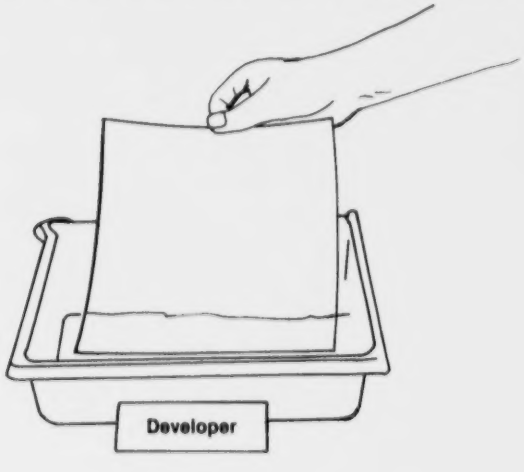
      FIGURE 2



   b. Slide print paper quickly into developer. (Figure 3)

      (NOTE: Make sure the entire sheet becomes wet at the same time. Chemicals should be approximately 68°F. Recommended developing time is one minute. Do not overdevelop or allow print to become too dark.)

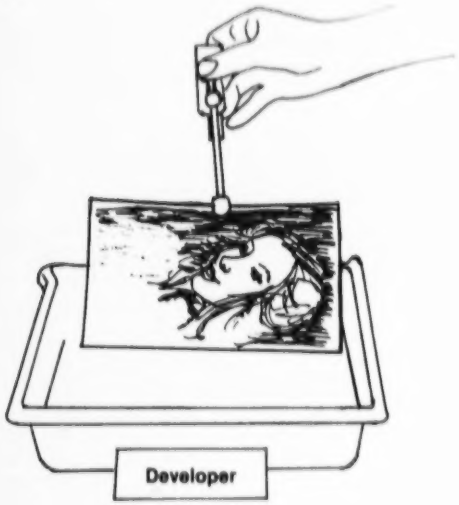
      FIGURE 3



JOB SHEET #3

c. Remove print from developer with tongs. (Figure 4)

FIGURE 4



d. Hold print above developer tray and allow it to drain briefly.

e. Transfer print to stop bath tray for five seconds.

(NOTE: Do not allow tongs from developer to come in contact with stop bath.)

f. Transfer print to fixer.

(NOTE: Use second pair of tongs at this time. Check with instructor for exact time to leave print in fixer bath.)

g. Wash print in running water (print washer) for instructor's recommended time.

h. Lay print on a flat, clean surface.

i. Use a squeegee to remove excess water.

(NOTE: This promotes faster drying.)

j. Allow print to dry completely at room temperature.

(NOTE: Print quality can be improved by cropping, burning, dodging, and using filters. Your instructor will supply information on these processes.)

4. Clean up area following instructor's directions.

PHOTOGRAPHY
UNIT VI

PRACTICAL TEST
JOB SHEETS #1-#3 — TAKE A SERIES OF PICTURES, PROCESS FILM, AND PRINT A PICTURE

STUDENT'S NAME _____ DATE _____

EVALUATOR'S NAME _____ ATTEMPT NO. _____

Instructions: When you are ready to perform this task, ask your instructor to observe the procedure and complete this form. All items listed under "Process Evaluation" must receive a "Yes" for you to receive an overall performance evaluation.

PROCESS EVALUATION

(EVALUATOR NOTE: Place a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. If the student is unable to achieve this competency, have the student review the materials and try again.)

The student:	YES	NO
1. Checked out proper equipment and materials.	_____	_____
2. Used camera correctly.	_____	_____
3. Developed film correctly.	_____	_____
4. Produced quality negatives.	_____	_____
5. Used processing chemicals safely.	_____	_____
6. Developed a quality print.	_____	_____
7. Used darkroom equipment and chemicals properly.	_____	_____
8. Showed improvement with picture taking.	_____	_____
9. Checked in/put away equipment and materials.	_____	_____
10. Cleaned the work area.	_____	_____
11. Performed steps in a timely manner (___hrs. ___min. ___sec.)	_____	_____
12. Practiced safety rules throughout procedure.	_____	_____
13. Provided satisfactory responses to questions asked.	_____	_____

EVALUATOR'S COMMENTS: _____

_____

JOB SHEETS #1-#3 PRACTICAL TEST

PRODUCT EVALUATION

(EVALUATOR NOTE: Rate the student on the following criteria by circling the appropriate numbers. Each item must be rated at least a "3" for mastery to be demonstrated. (See performance evaluation key below.) If the student is unable to demonstrate mastery, student materials should be reviewed and another product must be submitted for evaluation.)

Criteria:

	4	3	2	1
Subject stands out clearly and is properly balanced in picture				
	4	3	2	1
Negatives are good quality				
	4	3	2	1
Subject is in focus				
	4	3	2	1
Print is properly exposed				

EVALUATOR'S COMMENTS: _____

_____

PERFORMANCE EVALUATION KEY
4 — Skilled — Can perform job with no additional training. 3 — Moderately skilled — Has performed job during training program; limited additional training may be required. 2 — Limited skill — Has performed job during training program; additional training is required to develop skill. 1 — Unskilled — Is familiar with process, but is unable to perform job.

(EVALUATOR NOTE: If an average score is needed to coincide with a competency profile, total the designated points in "Product Evaluation" and divide by the total number of criteria.)

PHOTOGRAPHY
UNIT VI

NAME _____ SCORE _____

TEST

1. Match the terms on the right with the correct definitions.

_____a.	Numbers which identify the aperture sizes of a camera lens	1. ASA or ISO number
_____b.	The distance in millimeters from the aperture to the film plane when the film is focused to infinity	2. Contact print
_____c.	A term used to identify a film's sensitivity to light	3. Depth of field
_____d.	The best way to determine which enlarger exposure time makes the best print	4. Enlargement
_____e.	A print made by exposing photographic paper while it is in contact with one or more negatives	5. Film speed
_____f.	A photographic print that is larger than its negative	6. Focal length
_____g.	Special darkroom light that will not expose film	7. F-stop
_____h.	A film rating number that identifies a film's sensitivity to light; used to program the camera's metering system	8. Panning
_____i.	The range of distance in which everything appears in sharp focus	9. Safelight
_____j.	Moving the camera to follow a subject that is also moving	10. Shutter speed
_____k.	Length of time that light strikes the film	11. Step-off test printer

TEST

2. Match the basic parts of a camera on the right with the correct descriptions.

_____a.	Plastic or glass device that directs (focuses) light rays on the film	1. Aperture
_____b.	The opening (hole) in the lens that controls the amount of light entering the camera	2. Lens
_____c.	The eyepiece that the photographer looks through to compose the picture to be taken	3. Shutter
_____d.	Controls the length of time that light may enter the camera lens and strike the film	4. Viewfinder

3. Complete the following statements on how a camera works by circling the word(s) that best completes each statement.

   a. A camera is basically a (**light box, black box**) with one end holding the film and the other having a small hole which can be briefly opened.

   b. When the hole is uncovered, light reflected off any object in front of the box travels through the hole and strikes the (**aperture, film**).

   c. A (**shutter, lens**) is located in front of the opening in the box to gather and concentrate light onto the film.

   d. The (**viewfinder, automatic focus**) shows what part of the scene will be in the photograph.

4. Match the basic types of cameras on the right with the correct descriptions.

_____a.	Are designed for studio, advertising, and some newspaper photography	1. Instant picture cameras
_____b.	Negatives are usually too small for professional work	2. Large format cameras
_____c.	Are designed for more serious amateurs and photojournalists; most use 35mm film	3. Single-lens reflex cameras
_____d.	Have a top lens for focusing and viewing and a bottom lens for projecting image onto film. Parallax error is a problem with this camera.	4. Small format cameras with fixed features
_____e.	Take and develop a picture in a minute or less	5. Twin-lens reflex cameras
_____f.	Produce large negatives (usually 4" × 5") for high-quality prints	

TEST

5. Distinguish between the common types of camera lenses by placing the following letters next to the correct descriptions:

N — Normal lens
T — Telephoto lens
W — Wide-angle lens
Z — Zoom lens

_____a. Makes the subject matter look bigger than it is.

_____b. Makes the subject matter look smaller than it is.

_____c. Sees more of the scene than a normal lens.

_____d. Sees image size and distance relationships about the same as the human eye.

_____e. Designed for general picture-taking such as outdoor scenes, people, pets, and social events.

_____f. Designed to replace the many lenses that a professional photographer needs because it can do the jobs of many lenses.

_____g. Designed for photographing sporting events, wildlife pictures, and distance shots.

_____h. Adjustable for a wide variety of distances.

6. Select true statements on how to care for a camera by placing an "X" next to the true statements.

_____a. Store or carry a camera in its protective case.

_____b. Store your camera in the attic, basement, or car glove compartment.

_____c. Always keep a lens cap over the lens when camera is not in use.

_____d. Use eyeglass tissue to clean a camera's lens.

_____e. Disassemble your camera's lens if it is difficult to focus.

_____f. All camera parts should be lubricated on a regular basis.

_____g. Advance the film before storing so that the camera is cocked and ready to take the next picture.

TEST

7. Distinguish between types of light meters by placing an "X" next to the description of a reflected light meter.

   _____a. Reads the light falling on the subject; it should be used near the subject, not at the camera position unless lighting on both subject and camera is the same.

   _____b. Measures the light reflected from the subject to the meter; it is pointed at the subject to be photographed.

8. List three basic types of film.

   a. _____

   b. _____

   c. _____

9. Match modes of film on the right with the correct descriptions.

   _____a. Used for large format camera and enlarging; also referred to as cut film

   _____b. Most common type of film; contained in a light-tight canister called a magazine

   _____c. Enables the photographer to control the number of shots by loading only the amount of film to be used

   _____d. Comes in a plastic container that is loaded into camera; usually for 110 or 126 instamatic cameras

   1. Cartridge film
   2. Reloadable cartridge
   3. Roll film
   4. Sheet film

10. Select true statements on how to take photographs by placing an "X" next to the true statements.

    _____a. Hold the camera steady.

    _____b. Tilt the camera.

    _____c. Jab the shutter release button.

    _____d. Use an unfocused camera.

    _____e. Center your eye in the viewfinder.

    _____f. Keep the background cluttered.

    _____g. Set your subject exactly in the middle of the picture.

    _____h. Use a flash as directed in your camera's manual.

TEST

11. Arrange in order the four main steps in producing a photograph by writing the correct sequence numbers in the blanks.

    _____a. Process the film.

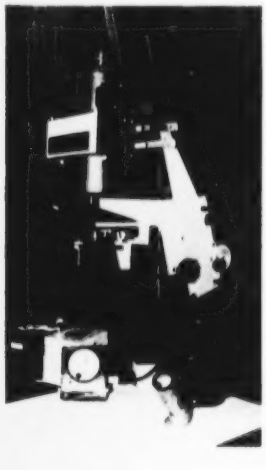
    _____b. Make a photographic print.

    _____c. Take the picture.

    _____d. Prepare the film for processing.

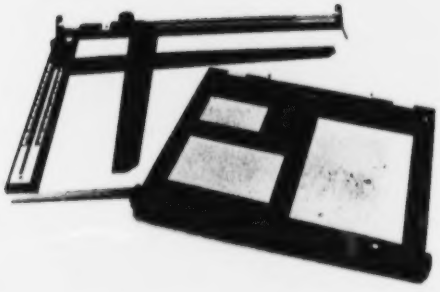
12. Identify the following types of film processing materials and equipment.

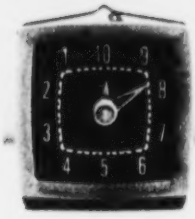
a. _____ b. _____



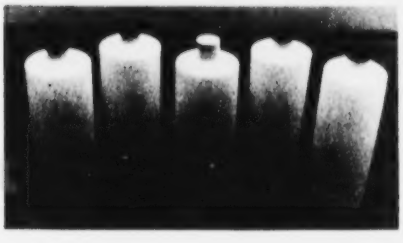
c. _____ d. _____

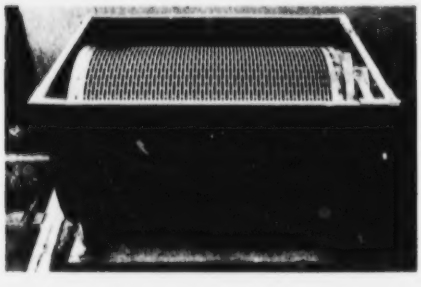
TEST



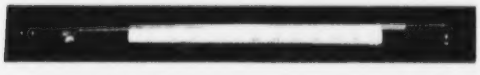


e. _____ f. _____





g. _____ h. _____



i. _____

TEST

13. Match chemicals used in developing black and white film on the right with the correct functions.

_____a.	Chemical used after the washing process to aid even drying	1. Developer
_____b.	Acidic chemical that stops and neutralizes the developing process	2. Fixer
_____c.	Chemical that causes exposed film to form a visible image	3. Fixer neutralizer
_____d.	Acidic chemical that dissolves undeveloped crystal on film and stabilizes film emulsion	4. Stop bath
_____e.	Chemical that rapidly removes fixer from photographic emulsion and greatly reduces wash time for film and paper	5. Wetting agent

14. Select true statements concerning general lab rules by placing an "X" next to the true statements.

_____a. Wear old clothing or an apron when working.

_____b. You may take drinks into the lab.

_____c. Use your hands to handle prints.

_____d. Try to fix the equipment if it does not work properly.

_____e. Put bad prints or test strips on the instructor's desk.

_____f. Do not place anything wet in the enlarger booth such as wet prints.

(NOTE: If the following activities have not been accomplished prior to the test, ask your instructor when they should be completed.)

15. Identify good characteristics of a photograph. (Assignment Sheet #1)

16. Demonstrate the ability to:

a. Take a series of black and white pictures. (Job Sheet #1)

b. Process black and white film. (Job Sheet #2)

c. Print a picture. (Job Sheet #3)

PHOTOGRAPHY
UNIT VI

ANSWERS TO TEST

1. a. 7 e. 2 i. 3
   b. 6 f. 4 j. 8
   c. 5 g. 9 k. 10
   d. 11 h. 1

2. a. 2
   b. 1
   c. 4
   d. 3

3. a. Light box
   b. Film
   c. Lens
   d. Viewfinder

4. a. 2 d. 5
   b. 4 e. 1
   c. 3 f. 2

5. a. T e. N
   b. W f. Z
   c. W g. T
   d. N h. Z

6. a, c

7. b

8. a. Black and white
   b. Color
   c. Color slides

9. a. 4
   b. 3
   c. 2
   d. 1

10. a, e, h

11. a. 3
    b. 4
    c. 1
    d. 2

ANSWERS TO TEST

12. a. Developing tank
    b. Tongs
    c. Enlarger
    d. Negative carrier
    e. Easel
    f. Timer
    g. Developing chemicals
    h. Print washer
    i. Thermometer

13. a. 5
    b. 4
    c. 1
    d. 2
    e. 3

14. a, f

15. Evaluated to the satisfaction of the instructor

16. Performance skills evaluated to the satisfaction of the instructor

ELECTRONIC COMMUNICATION
UNIT VII

UNIT OBJECTIVE

After completion of this unit, the student should be able to write a research paper and use electronic devices to present a radio or television commercial. Competencies will be demonstrated by completing the assignment sheet, job sheets, and the unit tests with a minimum score of 85 percent.

SPECIFIC OBJECTIVES

After completion of this unit, the student should be able to:

1. Match terms related to electronic communication with the correct definitions.
2. Match electronic communication devices with the correct descriptions.
3. Complete statements concerning emerging communication transmission technologies.
4. Classify steps in developing audio/audiovisual productions as pre-production, production, or post-production.
5. Select true statements concerning developing production scripts for radio and television.
6. Complete statements concerning composing a storyboard.
7. Match terms related to radio production with the correct definitions.
8. Match terms related to television production with the correct definitions.
9. Identify basic camera shots.

OBJECTIVE SHEET

10. Write a research paper. (Assignment Sheet #1)

11. Demonstrate the ability to:

    a. Prepare and present a thirty-second radio commercial. (Job Sheet #1)

    b. Prepare and record a one-minute television commercial. (Job Sheet #2)

ELECTRONIC COMMUNICATION
UNIT VII

SUGGESTED ACTIVITIES

A. Obtain additional materials and/or invite resource people to class to supplement/reinforce information provided in this unit of instruction.

(NOTE: This activity should be completed prior to the teaching of this unit.)

B. Make transparencies from the transparency masters included with this unit.

C. Provide students with objective sheet.

D. Discuss unit and specific objectives.

E. Provide students with information and assignment sheets.

F. Discuss information and assignment sheets.

(NOTE: Use the transparencies to enhance the information as needed.)

G. Provide students with job sheets.

H. Discuss and demonstrate the procedures outlined in the job sheets.

I. Integrate the following activities throughout the teaching of this unit:

1. Send a radio signal around the room using a laser. Demonstrate interference during the process.

2. Show models of satellites and discuss their operation.

3. Stress the importance of voice quality and appearance when making recordings.

4. Plan to have the students rate each other on their radio and television productions.

5. Have the students prepare and tape a 15-minute radio or television program as an optional activity.

6. Order television scripts from the national networks for popular programs the students are familiar with.

7. Have students listen to a taped classic radio program.

8. Integrate AIASA student activities.

9. Meet individually with students to evaluate their progress through this unit of instruction, and indicate to them possible areas for improvement.

SUGGESTED ACTIVITIES

J. Administer test.

K. Evaluate test.

L. Reteach if necessary.

REFERENCES USED IN DEVELOPING THIS UNIT

A. Jones, Ronald E. and Janet L. Robb. *Discovering Technology Communication*. Dallas, Texas: Harcourt Brace Jovanovich Publishers, 1986.

B. Bame, E. Allen and Paul Cummings. *Exploring Technology*. Worcester, MA: Davis Publications, Inc., 1980.

C. Williams, C.F., K.S. Badrkham, and W.R. Daggett. *Technology at Work*. Dallas, TX: South-Western Publishing Co., 1987.

D. Hauenstein, A. Dean and Steven A. Bachmeyer. *Introduction and Radio Broadcasting: Activity Manual*. Bloomington, IL: McKnight Publishing Co., 1975.

E. Hauenstein, A. Dean and Steven A. Bachmeyer. *Television Broadcasting: Activity Manual*. Bloomington, IL: McKnight Publishing Co., 1975.

F. Hauenstein, A. Dean and Steven A. Bachmeyer. *The World of Communications: Audiovisual Media*. Bloomington, IL: McKnight Publishing Co., 1975.

G. Utz, Peter. *Video User's Handbook*. 2nd ed. Englewood Cliffs, NJ: Prentice-Hall Inc., 1982.

SUGGESTED SUPPLEMENTAL RESOURCES

A. *Radio and Television Production*, CS-164. Sound recorders, video equipment operators, switchers, and transmitter operators discuss their jobs and the prerequisite training found within a technical school program. Specializations such as record production are included. Those involved are filmed within their own setting of radio stations, television stations, and recording studios. Available in VHS and Beta from: Morris Video, 413 Avenue G #1, P.O. Box 443, Redondo Beach, CA 90277, 800-843-3606.

B. Markman, Roberta H. and Marie L. Waddell. *10 Steps in Writing the Research Paper*. Woodbury, NY: Barron's Educational Series, Inc., 1971.

ELECTRONIC COMMUNICATION
UNIT VII

INFORMATION SHEET

I. **Terms and definitions**

A. Audio — Relating to sound and its reproduction

B. Electronic communication — The exchange of information using electronic devices

C. Format — Pattern of a program including the subject, time, date, and length of program

Examples: News, talk show

D. Script — The written text of a performance including dialogue and production techniques

E. Storyboard — Series of rough sketches of each scene of an audiovisual program with notes on production techniques

F. Transition — Moving from one part of a program to another

G. Video — Relating to the transmission or reception of the television image (picture)

II. **Electronic communication devices** (Transparencies 1 and 2)

A. Radio — Uses electromagnetic air waves to transmit audio messages.

B. Record player — Has a stylus (needle) which converts grooves in the surface of a record into audio messages.

C. Compact disk — Uses a laser to record and playback audio and video messages.

(NOTE: Compact disks have improved sound quality over traditional records, as well as more storage capacity.)

D. Tape recorder/player — Records audio messages onto a magnetic tape for later playback.

E. Mixer — Controls and blends sounds picked up from various sources.

F. Telephone — Sends and receives audio messages primarily through metal wires or fiberoptic cables.

(NOTE: Telephone companies have been major contributors in the development of laser, microwave, satellite, and fiberoptic transmission methods. These new methods provide higher-quality, lower-cost long-distance transmission of signals.)

INFORMATION SHEET

G. Television — Uses a television camera to record video signals and microphones to record audio signals which are transmitted through air waves or cables. Television sets receive these signals and convert them back to pictures and sound.

H. Videocassette recorder/player — Records both audio and video signals onto a magnetic tape as received from a television set for later playback.

(NOTE: A video camera and recorder [camcorder] may be used to record "live" performances on tape for playback on a videocassette recorder/player. This is the recommended equipment to use in Job Sheet #2 for your television commercial.)

I. Computers, microcomputers, and related hardware — Store, retrieve, and process information (data). Can be used to organize, manipulate, and transmit audio and video messages.

(NOTE: Computers are dramatically changing our world and the way we communicate, especially the way information is exchanged in industry.)

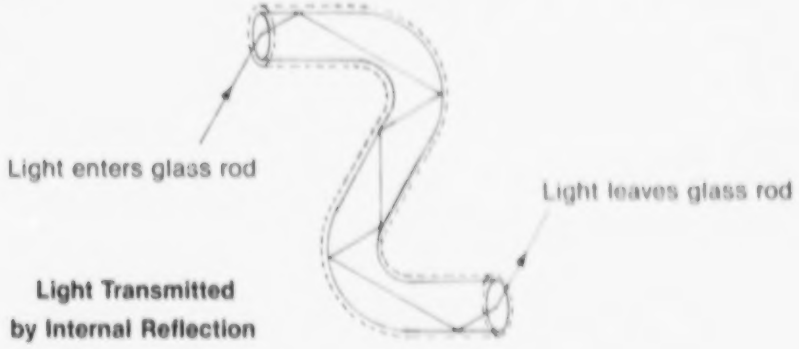
III. Emerging communication transmission technologies

A. Lasers — Transmit signals (or messages) through the atmosphere using coherent electromagnetic radiation; do not use mechanical devices, fluids, or electrical wires.

(NOTE: The word laser comes from **L**ight **A**mplification by **S**timulated **E**mission of **R**adiation.)

B. Fiberoptics — Transmit light through thin transparent fibers of glass or plastic.

(NOTE: Cables made up of these fiberoptic strands are being used more commonly by telephone companies because they take less space than traditional copper cables and also carry a greater number and better quality of calls.)



Light Transmitted by Internal Reflection

INFORMATION SHEET

C. Microwaves — Wireless method of sending signals over a long distance using short electromagnetic waves (microwaves).

D. Satellites — Man-made objects that orbit the earth that are used by telephone and television networks to receive and transmit audio and video messages over great distances. A satellite dish is required to receive the signals. (Transparency 3)

IV. Steps in developing audio/audiovisual productions

A. Pre-production

1. Decide on appropriate format.

   Examples: News, talk show, comedy, commercial

2. Select workers.

   Examples: Writers, production crew, performers, narrator, director

3. Write rough draft.

4. Obtain approval for rough draft.

5. Prepare storyboard. (for audiovisual productions)

6. Write script.

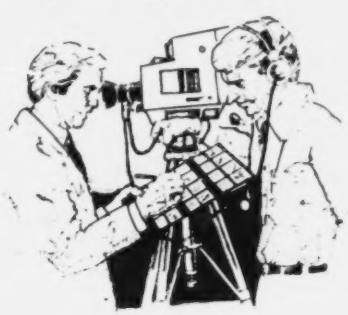
7. Reserve or rent production equipment and location site.

8. Prepare or obtain props, costumes, and scenery.

9. Rehearse performers and production crew.

B. Production

1. Shoot videotapes or slides on location (for audiovisual productions) or record the audio program.



INFORMATION SHEET

2. Shoot additional videotapes or slides in the studio (for audiovisual productions).

C. Post-production

1. Record narration, music, and special effects as needed and mix.

   (NOTE: If you do not have mixing capabilities, you will need to record these additional audio portions while you are recording the rest of the program.)

2. Obtain approval for final production.

3. Air or show final production to audience.

4. Evaluate final production.

   a. Content

   b. Timing

   c. Delivery

   d. Sound quality

   e. Picture quality

V. **Developing production scripts** (Transparency 4)

(NOTE: Scripts may be very complete with all narration written word for word as well as all production techniques noted, or scripts may be briefly written without a lot of detail showing only summaries of the action and the proper sequence of events. The following guidelines are for developing a complete [or full] script.)

A. Radio scripts

1. Scripts should include the dialogue, sound effects, music, and production techniques.

2. Dialogue should be written in a conversational style as would be typical of the character speaking.

3. Use simple sentences so the audience can easily follow along.

4. The number of character voices should be kept to a minimum to keep from confusing the audience.

5. When writing radio scripts, keep in mind that the audience can not see the scenery or the expressions of the characters. Therefore, these qualities and other important actions (entrances, etc.) must be demonstrated through the dialogue, voice inflections, and sound effects.

INFORMATION SHEET

B. Television scripts

1. All dialogue, sound effects, and music should be noted in the script.

2. Scenery, costumes, and props, which are not needed in radio performances, are very important in television performances. They add a great deal of information and personality to the performance. These components should be noted in the production script.

3. A storyboard is usually used to test the effective flow of events before the film is shot.

4. Camera distances and angles, techniques for transitioning from scene to another, and lighting details should also be noted in the script.

VI. **Composing a storyboard** (Transparency 5)

A. A storyboard is an arrangement of storycards with each storycard representing one shot or slide.

B. A storyboard allows for individual shots to be reviewed and rearranged, eliminated, or redone as needed.

C. Storycards are usually made from 5" × 7" or 4" × 6" index cards.

D. Each storycard should be limited to one idea only.

E. Storycards should contain the following information:

1. Frame (shot or slide) number in the upper right corner

2. Sketch or print of what the frame will show in the upper left part

3. Narration or summary of dialogue and/or action that will accompany frame across the bottom of the card

4. Notes on production techniques on the right side of the card (below the frame number)

VII. **Radio production terminology**

A. B.G. — Background (music or sound)

B. Clear — Signal that the program is off the air

C. Cue — Signal given to begin

INFORMATION SHEET

D. Fade in — Increasing volume of music, sound, or speech

E. Fade out — Decreasing volume of music, sound, or speech

F. Off mike — Turning away from the microphone to speak for a special effect

G. On mike — Speaking directly into the microphone at the correct distance

H. Segue (pronounced seg-way) — Transition without pause from one musical number to another

I. S.E. — Sound effect

Examples: Door slamming, wind, creaking stairs, footsteps, birds chirping

J. Stand-by — Direction that program is about to begin so cast and crew need to be ready

VIII. Television production terminology

A. Background (B.G.) — Props and scenery placed behind the performers; also any supporting music or sound effects

B. Boom mike — A microphone suspended from a long, movable arm attached to a stand off screen; used to follow performers when they move and still remain out of camera sight

C. Cue — Signal given to begin or the last words of the preceding performer which let a performer know that his/her part is next

D. Cut — Switching from one screen to another

E. Dissolve — Two pictures merging with one picture coming on as the other goes off

F. Panning — Moving the camera horizontally (side-to-side)

G. Shot — The picture taken by the camera

H. S.E. — Sound effect

I. Tilting — Moving the camera vertically (up and down)

J. Voice over (VO) — Narration in which the speaker is not visible on the screen

K. Zoom in/out — Moving the camera toward or away from the subject

INFORMATION SHEET

IX. Basic camera shots

A. Distance of shot

1. Long shot (LS) — General view of the setting

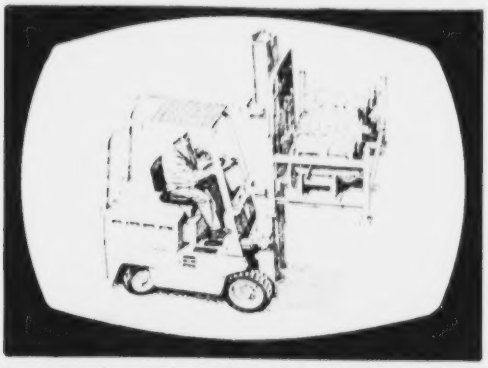
2. Medium shot (MS) — Closer view of the subject, eliminating unnecessary background

3. Close-up (CU) — Concentrated view of the subject. A close-up of a person usually includes only the face.

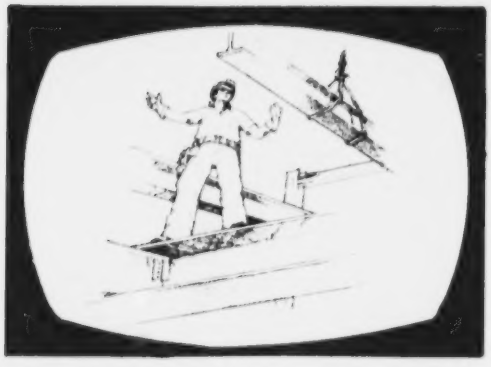
INFORMATION SHEET

B. Angle of shot

1. High angle shot — Shot from above; gives the illusion of reducing the size of the subject.



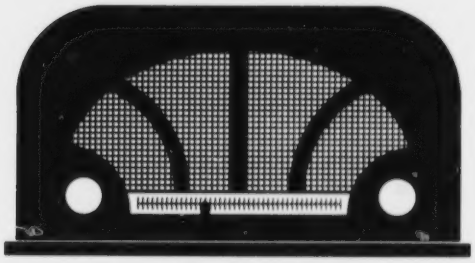
2. Low angle shot — Shot from below; tends to exaggerate the height.



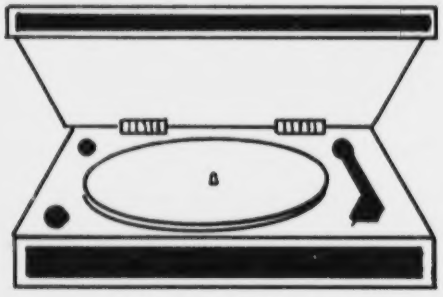
3. Normal camera position — Near eye level of a standing person; most shots are from this position.

(NOTE: The various angles and distances of shots may be combined for different effects.)

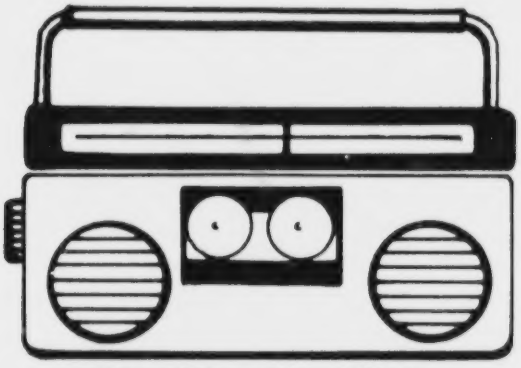
Electronic Communication Devices



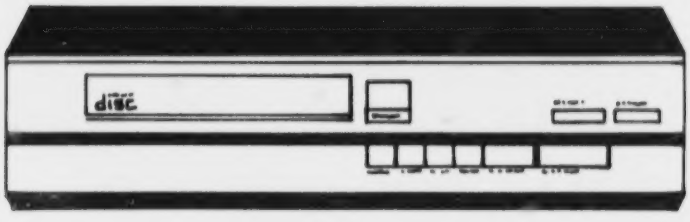
Radio



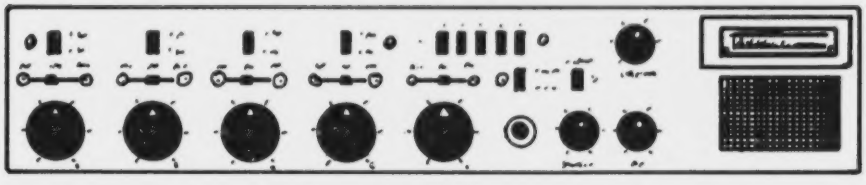
Record Player



Tape Recorder/Player

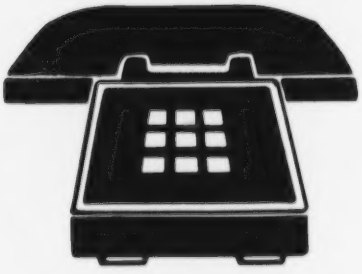


Compact Disk



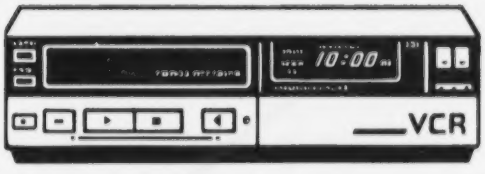
Mixer

Electronic Communication Devices
(Continued)

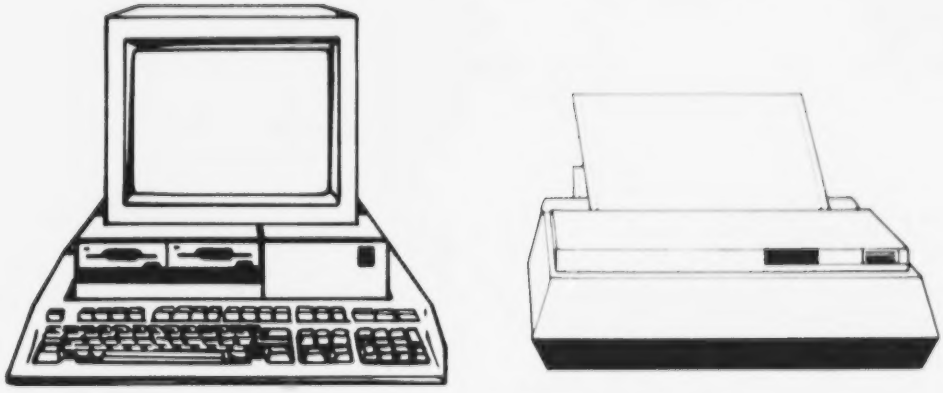


Telephone

Television

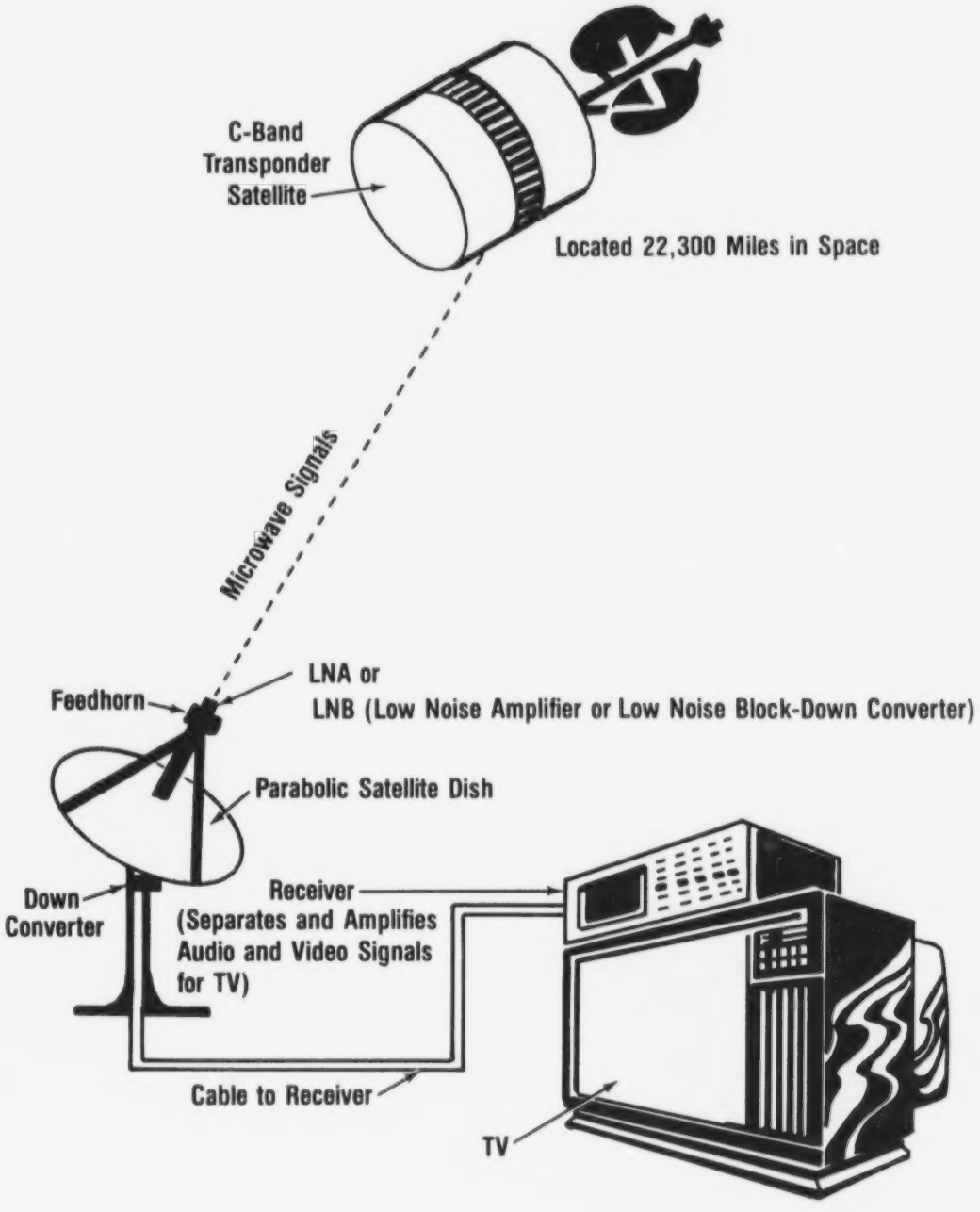


Videocassette Recorder (VCR)



Computer and Related Hardware

Communication Transmission by Satellite



Production Scripts

SOUND:	B.G. Music. Fade out.
JENNIFER:	Oh, Tracy, I love your sweater. Where did you get it?
TRACY:	Thanks, Jennifer. I got it at the new store across from school. It's called the "Teen Shoppe," and it just has everything! And the prices are great too.
JENNIFER:	Let's go there tomorrow and shop. I'd love to see what they have.
SOUND:	B.G. music. Fade in.
ANNOUNCER:	Visit the "Teen Shoppe" for the latest fashions at Four-thirty-three South Main in Brookville.

Radio Script

FRAME	TIME (sec)	VISUAL	NARRATION/S.E.
1.	5	Two female teenagers sitting on bed talking to each other. M.S. of both girls, then C.U. of Jennifer.	**Jennifer:** Oh, Tracy, I love your sweater. Where did you get it?
2.	12	C.U. of Tracy	**Tracy:** Thanks, Jennifer. I got it at the new store across from school. It's called the "Teen Shoppe," and it just has everything! And the prices are great too.
3.	5	C.U. of Jennifer	**Jennifer:** Let's go there tomorrow and shop. I'd love to see what they have.
4.	8	C.U. of Teen Shoppe shopping bag with logo.	**V.O. Announcer:** Visit the "Teen Shoppe" for the latest fashions at four-thirty-three South Main in Brookville.

Television Script

Storyboard

Sketch of Shot

Frame # _____

Production Notes: _____

Narration: _____

Sketch of Shot

Frame # _____

Production Notes: _____

Narration: _____

Sketch of Shot

Frame # _____

Production Notes: _____

Narration: _____

Sketch of Shot

Frame # _____

Production Notes: _____

Narration: _____

Sketch of Shot

Frame # _____

Production Notes: _____

Narration: _____

Sketch of Shot

Frame # _____

Production Notes: _____

Narration: _____

ELECTRONIC COMMUNICATION
UNIT VII

ASSIGNMENT SHEET #1 — WRITE A RESEARCH PAPER

Directions: Write a research paper based on an electronic communication system or product that is presently being used or that is under development for the future.

You should start your research based on the information that you received in response to the business letter that you wrote to a manufacturer in Unit II. Continue your research with magazine and journal articles and books in your school or city library. Use the following guidelines:

1. Include a bibliography of all references used.
2. Include all charts, tables, drawings, and diagrams in an appendix at the end of the paper.
3. Type paper on 8½ x 11" plain white paper, front side only. **Double space.**
4. Limit the size of the paper to 10 pages.
5. Use the following format:
   a. Title page
   b. Table of contents
   c. Introduction (repeat title of paper at top of page)
   d. Review of reference findings (body of paper)
   e. Conclusion
   f. End notes/footnotes, if applicable
   g. Bibliography
   h. Appendix(es)
6. Your research paper will be critiqued using the following areas:
   a. Organization .....25 pts max
   (clear theme, proper order, etc)
   b. Evidence.....25 pts max
   (paper supported by specific evidence, research fits theme or point, etc)
   c. Mechanics .....25 pts max
   (correct spelling, sentence structure, paragraphing, properly endnoted/footnoted, grammar)
   d. Topic selection, interest, and originality .....25 pts max

ELECTRONIC COMMUNICATIONS
UNIT VII

ANSWERS TO ASSIGNMENT SHEET #1

Evaluate research papers in the following areas:

1. Correct paper used, typed double space, and front side only used.
2. Correct length; no more than 10 pages
3. Organization (logical order)
4. Evidence (adequate research done and noted)
5. Mechanics (grammar, endnotes)
6. Topic selection (on an electronic communication system or product)

ELECTRONIC COMMUNICATION
UNIT VII

JOB SHEET #1 — PREPARE AND PRESENT A THIRTY-SECOND RADIO COMMERCIAL

A. Equipment and materials

1. Tape recorder and tapes
2. Various items to create necessary sound effects
3. Clock or watch that displays seconds

B. Procedure

1. Meet with your assigned group and choose a product, service, or idea that you wish to promote through a commercial. Things to consider in your selection process:

   Eliminate topics that are in poor taste or that will offend some listeners.
   Keep your presentation simple.
   Make your presentation interesting.
   Be creative.

2. Decide on the duties of each member of the group. You will need writers, production crew, performers, director, and narrator or announcer.

3. Write the rough draft, and have your instructor approve it and sign below.

   Group # _____ Approved by _____
   (Instructor's Signature)

4. Prepare the script for the commercial including all speaking parts, music, and sound effects if needed.

5. Locate production equipment and learn how it operates.

6. Rehearse the performers and the production crew using the script. Time the practice session so it runs exactly 30 seconds. Make adjustments as needed.

7. Tape record your commercial once you are satisfied with the results of your practice sessions.

8. Play your commercial to the class.

9. Evaluate the final commercial production.

ELECTRONIC COMMUNICATION
UNIT VII

JOB SHEET #2 — PREPARE AND RECORD A ONE-MINUTE TELEVISION COMMERCIAL

A. Equipment and materials

1. Video camera and videotape
2. Video playback unit
3. Television
4. Various visual props and costumes
5. Clock or watch that displays seconds

B. Procedure

1. Meet with your assigned group and select a product, service, or other message to be promoted through a commercial. Points to consider for presentation:
   a. Stay with one central idea.
   b. Do not clutter message with unnecessary information.
   c. Keep ideas simple.
   d. Do not use poor taste.
2. Decide on the duties of each member of the group. These will be similar to those needed in Job Sheet #1 except that you will also need someone in charge of the set (scenery, backdrop), costumes, and props.
3. Write the rough draft, and have your instructor approve it and sign below.

   Group # _____ Approved by _____
   (Instructor's Signature)
4. Prepare the storyboard with one storycard for each scene or shot.
5. Prepare the complete script.
6. Locate production equipment and learn how it operates. Watch TV for examples of transitioning and shooting techniques.
7. Prepare or obtain props, costumes, and scenery. Keep everything simple.

JOB SHEET #2

8. Rehearse the performers and production crew using the storyboard and script. Time the practice session so it runs exactly one (1) minute. Make adjustments as needed.

9. Videotape the commercial when your group is satisfied with the rehearsal.

   (NOTE: Follow instructor's directions on video camera use.)

10. Play the finished commercial for the rest of the class.

11. Evaluate the final production.

ELECTRONIC COMMUNICATION
UNIT VII

PRACTICAL TEST
JOB SHEET #1 — PREPARE AND PRESENT A THIRTY-SECOND RADIO COMMERCIAL

STUDENT'S NAME _____ DATE _____

EVALUATOR'S NAME _____ ATTEMPT NO. _____

Instructions: When you are ready to perform this task, ask your instructor to observe the procedure and complete this form. All items listed under "Process Evaluation" must receive a "Yes" for you to receive an overall performance evaluation.

PROCESS EVALUATION

(EVALUATOR NOTE: Place a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. If the student is unable to achieve this competency, have the student review the materials and try again.)

The student:	YES	NO
1. Met with group and selected commercial idea.	_____	_____
2. Decided on duties of group members.	_____	_____
3. Wrote rough draft and obtained approval.	_____	_____
4. Wrote script.	_____	_____
5. Located production equipment and operated correctly.	_____	_____
6. Rehearsed commercial performance and timed it.	_____	_____
7. Recorded final commercial.	_____	_____
8. Played commercial for class.	_____	_____
9. Evaluated the commercial production.	_____	_____
10. Checked in/put away equipment and materials.	_____	_____
11. Cleaned the work area.	_____	_____
12. Used proper equipment correctly.	_____	_____
13. Performed steps in a timely manner (___hrs. ___min. ___sec.)	_____	_____
14. Practiced safety rules throughout procedure.	_____	_____
15. Provided satisfactory responses to questions asked.	_____	_____

EVALUATOR'S COMMENTS: _____

_____

JOB SHEET #1 PRACTICAL TEST

PRODUCT EVALUATION

(EVALUATOR NOTE: Rate the student on the following criteria by circling the appropriate numbers. Each item must be rated at least a "3" for mastery to be demonstrated. (See performance evaluation key below.) If the student is unable to demonstrate mastery, student materials should be reviewed and another product must be submitted for evaluation.)

Criteria:

	4	3	2	1
Content was appropriate				
	4	3	2	1
Acting, timing, and delivery were well rehearsed and sounded natural				
	4	3	2	1
Sound quality was good				
	4	3	2	1
Sound effects and music were effective				
	4	3	2	1
Performance was 30 seconds				

EVALUATOR'S COMMENTS: _____

_____

PERFORMANCE EVALUATION KEY
4 — Skilled — Can perform job with no additional training. 3 — Moderately skilled — Has performed job during training program; limited additional training may be required. 2 — Limited skill — Has performed job during training program; additional training is required to develop skill. 1 — Unskilled — Is familiar with process, but is unable to perform job.

(EVALUATOR NOTE: If an average score is needed to coincide with a competency profile, total the designated points in "Product Evaluation" and divide by the total number of criteria.)

ELECTRONIC COMMUNICATION
UNIT VII

PRACTICAL TEST
JOB SHEET #2 — PREPARE AND RECORD A ONE-MINUTE TELEVISION COMMERCIAL

STUDENT'S NAME _____ DATE _____

EVALUATOR'S NAME _____ ATTEMPT NO. _____

Instructions: When you are ready to perform this task, ask your instructor to observe the procedure and complete this form. All items listed under "Process Evaluation" must receive a "Yes" for you to receive an overall performance evaluation.

PROCESS EVALUATION

(EVALUATOR NOTE: Place a check mark in the "Yes" or "No" blanks to designate whether or not the student has satisfactorily achieved each step in this procedure. If the student is unable to achieve this competency, have the student review the materials and try again.)

The student:	YES	NO
1. Met with group and selected commercial idea.	_____	_____
2. Decided on duties of group members.	_____	_____
3. Wrote rough draft and obtained approval.	_____	_____
4. Prepared storyboard.	_____	_____
5. Wrote script.	_____	_____
6. Located production equipment and operated correctly.	_____	_____
7. Located or made props, costumes, and scenery.	_____	_____
8. Rehearsed commercial performance and timed it.	_____	_____
9. Videotaped final commercial.	_____	_____
10. Played commercial for class.	_____	_____
11. Evaluated the commercial production.	_____	_____
12. Checked in/put away equipment and materials.	_____	_____
13. Cleaned the work area.	_____	_____
14. Used proper equipment correctly.	_____	_____
15. Performed steps in a timely manner (___hrs. ___min. ___sec.)	_____	_____
16. Practiced safety rules throughout procedure.	_____	_____
17. Provided satisfactory responses to questions asked.	_____	_____

EVALUATOR'S COMMENTS: _____

_____

JOB SHEET #2 PRACTICAL TEST

PRODUCT EVALUATION

(EVALUATOR NOTE: Rate the student on the following criteria by circling the appropriate numbers. Each item must be rated at least a "3" for mastery to be demonstrated. (See performance evaluation key below.) If the student is unable to demonstrate mastery, student materials should be reviewed and another product must be submitted for evaluation.)

Criteria:				
Content was appropriate	4	3	2	1
Acting, timing, and delivery were well rehearsed and sounded natural	4	3	2	1
Props, sets, and costumes were effective	4	3	2	1
Sound quality was good	4	3	2	1
Picture quality was good	4	3	2	1
Camera and lighting techniques were effective	4	3	2	1
Performance was 1 minute	4	3	2	1

EVALUATOR'S COMMENTS: _____

_____

PERFORMANCE EVALUATION KEY
4 — Skilled — Can perform job with no additional training. 3 — Moderately skilled — Has performed job during training program; limited additional training may be required. 2 — Limited skill — Has performed job during training program; additional training is required to develop skill. 1 — Unskilled — Is familiar with process, but is unable to perform job.

(EVALUATOR NOTE: If an average score is needed to coincide with a competency profile, total the designated points in "Product Evaluation" and divide by the total number of criteria.)

ELECTRONIC COMMUNICATION
UNIT VII

TEST

NAME _____ **SCORE** _____

1. Match the terms on the right with the correct definitions.

_____a.	Moving from one part of a program to another	1. Audio
_____b.	Relating to sound and its reproduction	2. Electronic communication
_____c.	The written text of a performance including dialogue and production techniques	3. Format
_____d.	Pattern of a program including the subject, time, date, and length of program	4. Nonverbal communication
_____e.	Relating to the transmission or reception of the television image (picture)	5. Script
_____f.	The exchange of information using electronic devices	6. Storyboard
_____g.	Series of rough sketches of each scene of an audiovisual program with notes on production techniques	7. Transition
		8. Video

TEST

2. Match the electronic communication devices on the right with the correct descriptions.

_____a.	Uses electromagnetic air waves to transmit audio messages	1. Compact disk
_____b.	Uses a laser to record and playback audio and video messages	2. Computers, microcomputers, and hardware
_____c.	Records both audio and video signals onto a magnetic tape as received from a television set for later playback	3. Mixer
_____d.	Controls and blends sounds picked up from various sources	4. Radio
_____e.	Store, retrieve, and process information (data); can be used to organize, manipulate, and transmit audio and video messages	5. Record player
_____f.	Sends and receives audio messages primarily through metal wires or fiberoptic cables	6. Tape recorder/player
_____g.	Has a stylus (needle) which converts grooves in the surface of a record into audio messages	7. Telephone
_____h.	Uses a camera to record video signals and microphones to record audio signals which are transmitted through air waves or cables; special sets receive these signals and convert them back to pictures and sound	8. Television
		9. Videocassette recorder/player

3. Complete the following statements concerning emerging communication transmission technologies by circling the correct words.

a. Lasers transmit signals through (**fluids, electric wires, atmosphere**) using coherent electromagnetic radiation.

b. Fiberoptics transmit light through thin transparent fibers of (**glass, metal**).

c. Microwaves involve a (**wire, wireless**) method of sending signals over a long distance using short electromagnetic waves.

d. Satellites are man-made objects that orbit the (**sun, earth**) that are used by telephone and television networks to receive and transmit audio and video messages over great distances. A satellite dish is required to receive the signals.

TEST

4. Classify the following steps in developing audio/audiovisual productions as

   PRE — Pre-production
   PRO — Production
   POST — Post-production

   _____a. Air or show final production.

   _____b. Shoot videotapes or slides on location or record the audio program.

   _____c. Prepare storyboard.

   _____d. Write rough draft.

   _____e. Evaluate final production.

   _____f. Reserve or rent production equipment.

   _____g. Rehearse performers and production crew.

   _____h. Select workers (writers, crew, performers, etc.).

5. Select true statements concerning developing production scripts for radio and television by placing an "X" next to the true statements.

   _____a. Radio dialogue should be very formal such as that used in formal writing.

   _____b. In radio scripts the number of character voices should be kept to a minimum to keep from confusing the audience.

   _____c. Dialogue, sound effects, and music should be noted on both radio and television scripts.

   _____d. A storyboard is usually needed for radio scripts.

   _____e. A storyboard is usually used for television scripts.

   _____f. Scenery, props, and costumes should be noted on television production scripts.

TEST

6. Complete the following statements concerning composing a storyboard by circling the correct words.

   a. A storyboard is an arrangement of storycards with each storycard representing (**1, 2**) shot(s).

   b. A storyboard (**does, does not**) allow for individual shots to be reviewed before shooting.

   c. Storycards are usually made from (**posters, index cards**).

   d. Storycards should contain the frame number, narration or summary of dialogue or action, notes on production techniques, and (**acting techniques required, sketch of what the frame will show**).

7. Match the terms related to radio production on the right with the correct definitions.

_____a.	Decreasing volume of music, sound, or speech	1. B.G.
_____b.	Transition without pause from one musical number to another	2. Clear
_____c.	Sound effect	3. Cue
_____d.	Speaking directly into the microphone at the correct distance	4. Fade in
_____e.	Direction that program is about to begin so cast and crew need to be ready	5. Fade out
_____f.	Signal given to begin	6. Off mike
_____g.	Turning away from the microphone to speak for a special effect	7. On mike
_____h.	Increasing volume of music, sound, or speech	8. Segue
_____i.	Signal that the program is off the air	9. S.E.
		10. Stand-by
		11. Zoom in
		12. Zoom out

TEST

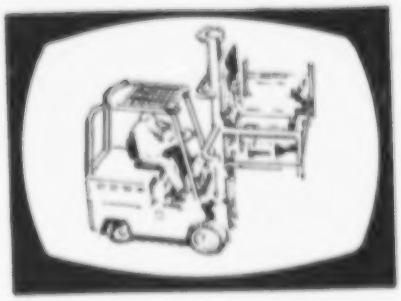
8. Match the terms related to television production on the right with the correct definitions.

_____a.	Switching from one screen to another	1. Background
_____b.	Moving the camera vertically (up and down)	2. Boom mike
_____c.	Two pictures merging with one picture coming on as the other goes off	3. Cue
_____d.	Sound effect	4. Cut
_____e.	Moving the camera toward or away from the subject	5. Dissolve
_____f.	Moving the camera horizontally (side to side)	6. Fade in
_____g.	Narration in which the speaker is not visible on the screen	7. Fade out
_____h.	The picture taken by the camera	8. Panning
_____i.	Props and scenery placed behind the performers; also any supporting music or sound effects	9. Shot
_____j.	Signal given to begin or the last words of the preceding performer which let a performer know that his/her part is next	10. S.E.
_____k.	A microphone suspended from a long, movable arm attached to a stand off screen; used to follow performers when they move and still remain out of camera sight	11. Tilting
		12. Voice over
		13. Zoom in/out

TEST

9. Identify the following basic camera shots.

   a. Angles



   1) _____ 2) _____

   b. Distances

   1) _____ 2) _____

(NOTE: If the following activities have not been accomplished prior to the test, ask your instructor when they should be completed.)

10. Write a research paper. (Assignment Sheet #1)

11. Demonstrate the ability to:

   a. Prepare and present a thirty-second radio commercial. (Job Sheet #1)

   b. Prepare and record a one-minute television commercial. (Job Sheet #2)

ELECTRONIC COMMUNICATION
UNIT VII

ANSWERS TO TEST

1. a. 7
   b. 1
   c. 5
   d. 3
   e. 8
   f. 2
   g. 6

2. a. 4
   b. 1
   c. 9
   d. 3
   e. 2
   f. 7
   g. 5
   h. 8

3. a. Atmosphere
   b. Glass
   c. Wireless
   d. Earth

4. a. POST
   b. PRO
   c. PRE
   d. PRE
   e. POST
   f. PRE
   g. PRE
   h. PRE

5. b, c, e, f

6. a. 1
   b. Does
   c. Index cards
   d. Sketch of what the frame will show

7. a. 5
   b. 8
   c. 9
   d. 7
   e. 10
   f. 3
   g. 6
   h. 4
   i. 2

8. a. 4
   b. 11
   c. 5
   d. 10
   e. 13
   f. 8
   g. 12
   h. 9
   i. 1
   j. 3
   k. 2

ANSWERS TO TEST

9. a. 1) Low angle
   2) High angle

   b. 1) Close up
   2) Long shot

10. Evaluated to the satisfaction of the instructor

11. Performance skills evaluated to the satisfaction of the instructor